

Test Specifications

Distributor-type

Fuel-injection Pumps

WPP 001/4 STE 5,0 d 1

1. Edition

En

Testoil-ISO 4113

VE 6/11 F 1150 R 92-1

0 460 416 033

 superseded
 company **Steyr**
 engine **WD 611 42**

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting 0,2 mm

see VDT-W-460/

1. Settings	Rot. speed rev/min	Settings	Charge-air press bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	800	3,6- 4,0 mm		
1.2 Supply-pump pressure	800	5,4- 6,0 bar (kgf/cm ²)		
1.3 Full-load delivery with charge-air pressure	-	- cm ³ /1000 strokes		
Full-load delivery without charge-air pressure	800	65,0-66,0 cm ³ /1000 strokes		3,5 (4,0)
1.4 Idle regulation	300	13,0-17,0 cm ³ /1000 strokes		3,0 (4,0)
1.5 Full-speed regulation	1230	21,0-27,0 cm ³ /1000 strokes		
1.6 Start	100	min. 80,0 cm ³ /1000 strokes		
1.7 Load-dependent port-closing				

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	500 0,5-1,3 (0,2-1,6)	800 (3,1-4,5)	1150 6,9-7,7 (6,6-8,0)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	500 4,0-4,6		1150 6,9-7,5
Overflow delivery	n = rev/min cm ³ /10 s	500 55-138 (40-153)		1150 55-138 (40-153)

2.3 Fuel deliveries	Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press bar (kgf/cm ²)	3. Dimensions for assembly and adjustment mm
End stop		1300	max. 1,5		K
		1230	(19,0-29,0)		KF
		1180	49,0-55,0 (47,0-57,0)		MS
		1130	67,5-69,5 (65,5-71,5)		SVS
		800	(62,5-68,5)		
		500	55,5-58,5 (53,2-60,8)		
switch-off		1150	0		A B
Idle stop		400 350 300	max. 1,5 1,0-7,0 (10,5-19,5)		Observations
End stop		170 250	min. 80,0 max. 55,0		
2.4 Solenoid	max. cut-in voltage xxx min. 10 V rated voltage 12V.				

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⑥

Test Specifications Distributor-type Fuel-injection Pumps

46

WPP 001/4 CUM 3,9 a

1. Edition

En

VE 4/12 F 1250 R 123

0 460 424 006

superseded
company: Cummins
engine: 4 T.390

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting 0,3 mm

see VDT-W-460/

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	900	2,3- 2,7 mm		
1.2 Supply-pump pressure	900	4,5- 5,1 bar (kgf/cm ²)		
1.3 Full-load delivery with charge-air pressure	-	cm ³ /1000 strokes		
Full-load delivery without charge-air pressure	1100	85,0-86,0 cm ³ /1000 strokes		4,0(4,5)
1.4 Idle regulation	375	18,5-24,0 cm ³ /1000 strokes		3,5(4,5)
1.5 Full-speed regulation	1340	24,5-32,5 cm ³ /1000 strokes		
1.6 Start	100	min. 97,0 cm ³ /1000 strokes		
1.7 Load-dependent port-closing	-			

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	750 1,1-1,9(0,8-2,2)	900 (1,8-3,2)	1100 3,2-4,0(2,9-4,3)	1250 3,7-4,5(3,4-4,8)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	400 2,3-2,9	750 3,8-4,4	1100 5,3-5,9	
Overflow delivery	n = rev/min cm ³ /10 s	600 55-138(40-153)	1250 55-138(40-153)		

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	1400	max. 1,0	
	1340	(23,5-33,5)	
	1250	80,0-83,0 (78,5-84,5)	
	1100	(82,5-88,5)	
	750	88,5-92,5 (86,7-94,3)	
	600	88,5-92,5 (86,7-94,3)	
switch-off			
Idle stop	450	max. 1,5	
	375	(16,5-26,5)	
	300	40,3-46,3 (38,3-48,3)	
End stop	130	min. 97,0	
	200	max. 85,0	
2.4 Solenoid	max. cut-in voltage test voltage	xx min. 10 V xxxx rated voltage 12V.	

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	-
KF	5,1-5,4
MS	1,4-1,6
SVS	4,2
A	
B	

Observations

Stop check electric
shutoff device at
375 min⁻¹

Testoil-ISO 4113

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A2

Test Specifications Distributor-type Fuel-injection Pumps

WPP 001/4 FOR 1,6 a

1. Edition

En

VE 4/9 F 2400 R 125

Test pressure line

supersedes

company Ford

0 460 494 122

6x2x450 mm / 1 680 750 073

engine: Kent Diesel

DHK: : 688 901 022/130 bar

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

mm

see VDT-W-460/.

1. Settings	Rot speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1500	4,3- 4,7 mm		
1.2 Supply-pump pressure	1500	5,3- 5,9 bar (kgf/cm ²)		
1.3 Full-load delivery with charge-air pressure	-	- cm ³ /1000 strokes		
Full-load delivery without charge-air pressure	1750	28,4-29,4 cm ³ /1000 strokes		2,5 (3,0)
1.4 Idle regulation	420	9,0-13,0 cm ³ /1000 strokes		2,0 (3,0)
1.5 Full-speed regulation	2675	10,4-16,4 cm ³ /1000 strokes		
1.6 Start	100	min. 50,0 cm ³ /1000 strokes		
1.7 Load-dependent port-closing	-			

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	800 1,0-1,8(0,7-2,1)	1500 (3,8-5,2)	2000 6,4-7,2(6,1-7,5)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	600 3,1-3,7		2000 6,6-7,2
Overflow delivery	n = rev/min cm ³ /10 s	500 55-138(40-153)		2400 55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2950 2675 2550 2400 1750 1000 600	max. 2,0 (9,4-17,4) 19,5-25,5 (18,5-26,5) 27,7-29,7 (26,4-31,0) (26,6-31,2) 24,8-27,8 (23,3-29,3) 23,4-26,4 (21,9-27,9)	
switch-off	2400	0	
Idle stop	570 475 420	max. 2,5 3,3-7,3 (1,3-9,3) (7,0-15,0)	
End stop	400 500	min. 30,0 max. 30,0	

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	3,2-3,4
KF	5,7-6,0
MS	1,6-1,85
SVS	3,4
AXK	23,3-25,3
EXL	10,4-13,8

Observations

2.4 Solenoid	max. cut-in voltage xxx min. 10 V rated voltage 12V.
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Testoil-ISO 4113

Test Specifications Distributor-type Fuel-injection Pumps

WPP 001/4 PEU 2,3k

2. Edition

Ea

VE 4/9 F 2075 R 126

0 460 494 121

DHK: 1 688 901 022/130 bar

Test pressure line
6x2x450 mm / 1 680 750 073supersedes 10.83
company Peugeot
engine XD 3 S

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

mm

see VDT-W-460/

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1500	5,8- 6,2 mm	0,8	
1.2 Supply-pump pressure	1500	5,6- 6,2 bar (kgf/cm ²)	0,8	
1.3 Full-load delivery with charge-air pressure	500	42,8-43,8 cm ³ /1000 strokes	0	
Full-load delivery without charge-air pressure	1500	54,5-55,5 cm ³ /1000 strokes	0,8	2,5(3,0)
1.4 Idle regulation	350	20,0-24,0 cm ³ /1000 strokes	0	2,0(3,0)
1.5 Full-speed regulation	2300	25,0-31,0 cm ³ /1000 strokes	0,8	
1.6 Start	100	min. 57,0 cm ³ /1000 strokes	0	
1.7 Load-dependent port-closing	-			

2. Test Specifications

checking values in brackets ()

2.1 Timing device LDA=0,8 bar	n = rev/min mm	750 0,8-1,6(0,5-1,9)	1000 2,5-3,3(2,7-3,6)	1500 (5,3-6,7)	2000 7,8-8,6(7,5-8,9)
2.2 Supply pump LDA=0,8 bar	n = rev/min bar (kgf/cm ²)	200 1,4-2,0	750 3,4-4,0	2000 7,1-7,7	
Overflow delivery	n = rev/min cm ³ /10 s	500 55-138(40-153)		2075 55-138(40-153)	

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2600	max. 1,0	0,8
	2300	(24,0-32,0)	0,8
	2200	38,0-44,0 (37,0-45,0)	0,8
	2000	53,0-55,0 (51,7-56,3)	0,8
	1500	(52,7-57,3)	0,8
	1000	52,0-55,0 (50,5-56,5)	0,8
	750*	48,7-49,7 (46,2-52,2)	0,25
	500	(40,3-46,3)	0
switch-off elektr.	400	0	
Idle stop	500	max. 1,0	
	400	8,0-12,0 (6,0-14,0)	
	350	(18,0-26,0)	
End stop	230	min.60	
	330	max.60	
2.4 Solenoid	max. cut-in voltage max. voltage	xxx min. 10 V rated voltage 12V.	

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	K1
KF	5,4-5,7
MS	1,2-1,4
SVS	4,6
A XK	20,2-22,2
B XL	9,3-12,6

Observations

Manifold-pressure
compensator stroke
= 4,5 mm
Correction at the
adjusting nut. (46)

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Test Specifications

Distributor-type

Fuel-injection Pumps

VE 4/9 F 2400 R 136

O 460 494 130

supersedes 7 83
company VWV
engine 086

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

mm

see VDT-W-460/

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1500	2,4 - 2,8 mm		
1.2 Supply-pump pressure	1500	4,3 - 4,9 bar (kgf/cm ²)		
1.3 Full-load delivery with charge-air pressure	1500	32,0 - 33,0 cm ³ /1000 strokes		2,5 (3,0)
Full-load delivery without charge-air pressure	-	cm ³ /1000 strokes		
1.4 Idle regulation	475	6,0 - 10,0 cm ³ /1000 strokes		2,0 (3,0)
1.5 Full-speed regulation	2600	11,0 - 17,0 cm ³ /1000 strokes		
1.6 Start	100	min. 35,0 cm ³ /1000 strokes		
1.7 Load-dependent port-closing				

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	1000 0,6-1,4 (0,3-1,7)	1500 (1,9-3,3)	2400 5,8-6,5 (5,5-6,9)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	600 2,2-2,8		2400 6,4-7,0
Overflow delivery	n = rev/min cm ³ /10 s	600 55-138 (40-153)		2400 55-138 (40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2800 2600 2400 1500 600	max. 3,0 (10,0-18,0) 27,3-29,3 (26,0-30,6) (30,2-34,8) 21,5-24,5 (20,0-26,0)	
switch-off elektr.	400	0	
Idle stop	475 650 1200	(4,0-12,0) max. 6,0 max. 5,0	
End stop	400 500	min. 18,0 max. 23,5	

3. Dimensions

for assembly
and adjustment
mm

Designation	mm
K	3,2-3,4
KF	5,7-6,0
MS	1,3-1,5
SVS	3,4
*FH	1,8-2,4
A	
B	

Observations
*operating
stroke (KSB)

2.4 Solenoid	max. cut-in voltage min. 10,0 V
	rated voltage 12V.

Test Specifications

Distributor-type

Fuel-injection Pumps

WPP 001/4 PEU 1,7 b

1. Edition

En

VE 4/8 F 2300 R 143

0 460 484 008

DHK: 1 688 901 022/130 bar

Test pressure line

6x2x450 mm / 1 680 750 073

supersedes

company

engine

Peugeot

XUD 7

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

see VDT-W-460/

Testoil-ISO 4113

Pre-stroke setting	mm	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1. Settings					
1.1 Timing device travel		1250	3,7- 4,3 mm		
1.2 Supply-pump pressure		1250	4,3- 4,9 bar (kgf/cm ²)		
1.3 Full-load delivery with charge-air pressure		-	- cm ³ /1000 strokes		
Full-load delivery without charge-air pressure		1250	28,0- 29,0 cm ³ /1000 strokes		2,5(3,0)
1.4 Idle regulation		400	4,0- 8,0 cm ³ /1000 strokes		2,0(3,0)
1.5 Full-speed regulation		2400	19,0- 25,0 cm ³ /1000 strokes		
1.6 Start		100	min. 42,0 cm ³ /1000 strokes		
1.7 Load-dependent port-closing		1250			

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	700 0,8-1,6(0,5-1,9)	1250 (3,3-4,7)	2000 7,8-8,2(7,3-8,7)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	700 2,8-3,4		2000 6,4-7,0
Overflow delivery	n = rev/min cm ³ /10 s			2300 55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2650 2500 2400 2250 2000 1250 700	max. 7,0 11,5-17,5 (10,5-18,5) (18,0-26,0) 27,4-29,4 (26,1-30,7) 28,2-30,2 (26,9-31,5) (26,2-30,8) 28,7-31,7 (27,2-33,2)	
switch-off	2300	0	
Idle stop	450 400	max. 5,0 (2,0-10,0)	
End stop	250 500	min. 44,0 max. 33,0	

3. Dimensions

for assembly
and adjustment
mm

Designation	mm
K	3,2-3,4
KF	5,2-5,5
MS	1,3-1,5
SVS	max 5,0
A	
B	

Observations

⑥

Test Specifications

Distributor-type

Fuel-injection Pumps

46

WPP 001/4 VWV 2,4 l

2. Edition

En

Testoil-ISO 4113

VE 6/10 F 2400 L 144

Overflow temperature 45° C

0 460 406 029

 superseded 10.83
 company VWV
 engine 087 T

Different test specs with restriction bore 0.86 mm. See Page 2!

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

mm

see VDT-W-460/

1. Settings

	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1500	1,2-1,6	mm	0,75	
1.2 Supply-pump pressure	1500	5,7-6,3	bar (kgf/cm ²)	0,75	
1.3 Full-load delivery with charge-air pressure	600	25,5-26,5	cm ³ /1000 strokes	0	
Full-load delivery without charge-air pressure	1500	44,0-45,0	cm ³ /1000 strokes	0,75	2,5 (3,0)
1.4 Idle regulation	375	6,0-10,0	cm ³ /1000 strokes	0	2,0 (3,0)
1.5 Full-speed regulation	2600	10,0-16,0	cm ³ /1000 strokes	0,75	
1.6 Start	100	min. 42	cm ³ /1000 strokes	0	
1.7 Load-dependent port-closing	-				

2. Test Specifications

checking values in brackets ()

2.1 Timing device LDA=0,75 bar	n = rev/min mm	1500 (0,7-2,1)	1500 (*)	2000 3,6-4,4(3,3-4,7)	2000 (*)	2400 5,6-6,4(5,3-6,7)
2.2 Supply pump LDA=0,75 bar	n = rev/min bar (kgf/cm ²)	600 3,3-3,9	1500* 6,8-7,4	2400 8,1-8,7		
Overflow delivery	n = rev/min cm ³ /10 s	600 (0 bar) 55-138(40-153)	2400 (0,75 bar) 55-138(40-153)			

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2750	max. 4,0	0,75
	2600	(9,0-17,0)	0,75
	2400	35,0-37,0 (33,7-38,3)	0,75
	1500	(42,2-46,8)	0,75
	800**	32,5-33,5 (30,0-36,0)	0,3
	600	(23,0-29,0)	0
switch-off			
elektr.	400	0	
Idle stop	375	(4,0-12,0)	
	450	max. 3,0	
End stop	400	min. 20	
	500	max. 30	

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	3,2-3,4
KF	6,3-6,6
MS	1,7-1,9
SVS	max. 6,0
**LDA-Hub	5,3
A	
B	

Observations

Please note instruc-
tions on sheet 2

2.4 Solenoid

 max. cut-in voltage xxx min. 10 V
 rated voltage 12V.

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12.83

A7

Adjustment angle = 0° = horizontal control lever position

Timing device

1500 1/min	2000 1/min	2000 1/min*	2400 1/min
0,8-1,2(0,3-1,7)	3,1-3,9(2,8-4,2)	5,8-7,0(5,7-7,1)	5,0-5,8(4,7-6,1)

Idle stop

415 1/min	6,0-10,0 (4,0-12,0)	ccm/1000 H.
-----------	---------------------	-------------

Full load

2850 1/min	max. 4,0	ccm/1000 H.
2675 1/min	10,0-16,0 (9,0-17,9)	ccm/1000 H.

* Test hydr. cold-start accelerator:

At the designated points do not apply voltage to magnet of hydr. cold-start accelerator.

1500 1/min 3,0-4,0 (2,8-4,2)

2000 1/min 4,9-6,1 (4,8-6,2)

⑥

Test Specifications Distributor-type Fuel-injection Pumps

46

WPP 001/4 VWW 2,4 1 1

2. Edition

En

supersedes 10.83
VWW
company:
engine: 087 T

Testoil-ISO 4113

VE 6/10 F 2400 L 144-1

Overflow temperature 45° C

0 460 406 030

Different test specs with restriction bore 0.86 mm. See Page 2!

All test specifications are valid only for Bosch Fuel-injection Pump Test benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

mm

see VDT-W-460/.

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
	1500	1,2-1,6 mm	0,75	
1.1 Timing device travel	1500	5,7-6,3 bar (kgf/cm ²)	0,75	
1.2 Supply-pump pressure	600	25,5-26,5 cm ³ /1000 strokes	0	
1.3 Full-load delivery with charge-air pressure	1500	44,0-45,0 cm ³ /1000 strokes	0,75	2,5 (3,0)
Full-load delivery without charge-air pressure	375	6,0-10,0 cm ³ /1000 strokes	0	2,0 (3,0)
1.4 Idle regulation	2600	10,0-16,0 cm ³ /1000 strokes	0,75	
1.5 Full-speed regulation	100	min. 42 cm ³ /1000 strokes	0	
1.6 Start	-	-		
1.7 Load-dependent port-closing	-	-		

2. Test Specifications

checking values in brackets ()

2.1 Timing device LDA=0,75 bar	n = rev/min mm	1500 (0,7-2,1)	1500 (*)	2000 3,6-4,4 (3,3-4,7)	2000 (*)	2400 5,6-6,4 (5,3-6,7)
2.2 Supply pump LDA=0,75 bar	n = rev/min bar (kgf/cm ²)	600 3,3-3,9	1500* 6,8-7,4	2400 8,1-8,7		
Overflow delivery	n = rev/min cm ³ /10 s	600 (0 bar) 55-138 (40-153)	2400 (0,75 bar) 55-138 (40-153)			

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2750	max. 4,0	0,75
	2600	(9,0-17,0)	0,75
	2400	35,0-37,0 (33,7-38,3)	0,75
	1500	(42,2-46,8)	0,75
	800**	32,5-33,5 (30,0-36,0)	0,3
	600	(23,0-29,0)	0
switch-off mech.	2400	0	
elektr.	400	0	
Idle stop	375	(4,0-12,0)	
	450	max. 3,0	
End stop	400	min. 20	
	500	max. 30	

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	3,2-3,4
KF	6,3-6,6
MS	1,7-1,9
SVS	max. 6,0
**LDA-Hub	5,3
A	
B	

Observations

Please note instruc-
tions on sheet 2
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12.83

Adjustment angle = 0° = horizontal control lever position

Timing device

1500 1/min	2000 1/min	2000 1/min*	2400 1/min
0,8-1,2(0,3-1,7)	3,1-3,9(2,8-4,2)	5,8-7,0(5,7-7,1)	5,0-5,8(4,7-6,1)

Idle stop

415 1/min	6,0-10,0 (4,0-12,0)	ccm/1000 H.
-----------	---------------------	-------------

Full load

2850 1/min	max. 4,0	ccm/1000 H.
2675 1/min	10,0-16,0 (9,0-17,9)	ccm/1000 H.

* Test hydr. cold-start accelerator:

At the designated points do not apply voltage to magnet of hydr. cold-start accelerator.

1500 1/min 3,0-4,0 (2,8-4,2)

2000 1/min 4,9-6,1 (4,8-6,2)

Test Specifications Distributor-type Fuel-injection Pumps

WPP 001/4 VWV 1,6 W 3

2. Edition

VE 4/9 F 2250 R 149

0 460 494 138

supersedes 7.83

company VWV

engine 086 T

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test instructions and Test Equipment

Pre-stroke setting

mm

see VDT-W-460/

1. Settings

	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1500	3,8 - 4,2 mm	0,75	
1.2 Supply-pump pressure	1500	4,6 - 5,2 bar (kgf/cm ²)	0,75	
1.3 Full-load delivery with charge-air pressure	600	23,5 - 24,5 cm ³ /1000 strokes	0	
Full-load delivery without charge-air pressure	1500	43,5 - 44,5 cm ³ /1000 strokes	0,75	2,5 (3,0)
1.4 Idle regulation	475	6,0 - 10,0 cm ³ /1000 strokes	0	2,0 (3,0)
1.5 Full-speed regulation	2525	9,0 - 15,0 cm ³ /1000 strokes	0,75	
1.6 Start	100	min. 35,0 cm ³ /1000 strokes	0	
1.7 Load-dependent port-closing	-			

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min	1000	1500	2250
LDA=0,75 bar	mm	1,8-2,6(1,5-2,9)	(3,3-4,7)	6,1-6,9(5,8-7,2)
2.2 Supply pump	n = rev/min	600		2250
LDA=0,75 bar	bar (kgf/cm ²)	2,5-3,1		6,5-7,1
Overflow delivery	n = rev/min	600		2250 (0,75 bar)
	cm ³ /10 s	55-138(40-153)		55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2750	max. 3,0	0,75
	2525	(8,0-16,0)	0,75
	2250	38,5-40,5 (37,3-41,7)	0,75
	1500	(41,8-46,2)	0,75
	1000 *	33,5-34,5 (31,8-36,2)	0,3
	600	(21,0-27,0)	0
switch-off			
elektr.	400	0	
Idle stop	475	(4,0-12,0)	
	1200	max. 5,0	
End stop	400	min. 22,0	
	500	max. 30,0	

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	3,2- 3,4
KF	5,7- 6,0
MS	1,2- 1,4
SVS	4,4
**FH	1,8- 2,4
XK	18,4-20,4
XL	8,6-12,0
A	
B	

Observations
Manifold-pressure
compensator stroke
= 4,0 mm
Correction at the
adjusting nut. (46)
*operating
stroke (KSB)

2.4 Solenoid max. cut-in voltage xxx min. 10,0 V
rated voltage 12V.

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Test ISO 4113

Test Specifications Distributor-type Fuel-injection Pumps

WPP 001/4 PEU 1,9 b

1. Edition

En

Testoil-ISO 4113

E 4/9 F 2300 R 162
0 460 494 153

Test pressure line
6x2x450 mm / 1 680 750 073

superseded
company Peugeot
engine XUD 9

DHK: 1 688 901 022/130 bar Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

mm

see VDT-W-460/...

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	2000	7,8- 8,2 mm		
1.2 Supply-pump pressure	1250	3,9- 4,5 bar (kgf/cm ²)		
1.3 Full-load delivery with charge-air pressure	-	- cm ³ /1000 strokes		
Full-load delivery without charge-air pressure *	1250	28,8-29,8 cm ³ /1000 strokes		2,5(3,0)
1.4 Idle regulation	A 550	3,5- 4,5 cm ³ /1000 strokes		B 2,5(3,0)
1.5 Full-speed regulation	2400	19,3-25,3 cm ³ /1000 strokes		
1.6 Start	100	min. 44,0 cm ³ /1000 strokes		
1.7 Load-dependent port-closing	1250			

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	700 0,5-1,5(0,3-1,7)	1250 3,4-4,2(3,1-4,5)	2000 (7,3-8,7)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	700 2,3-2,9		2000 5,9-6,5
Overflow delivery	n = rev/min cm ³ /10 s	600 55-138(40-153)		2300 55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2650 2500 2400 2250 2000 1250 700	max. 7,0 10,7-16,7 (9,7-17,7) (18,3-26,3) 28,9-30,9 (27,6-32,2) 29,7-31,7 (28,4-33,0) (27,0-31,6) 29,5-32,5 (28,0-34,0)	
switch-off	2300	0	
Idle stop	A 550 B 350 C 470	3,5- 4,5 8,0-12,0 (6,0-14,0) 8,0-12,0 (6,0-14,0)	
End stop	250 500	min. 40,0 max. 35,0	
2.4 Solenoid	max. cut-in voltage test voltage	xxx min. 10 V xxxxxx rated voltage 12V	

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	3,2-3,4
KF	5,7-6,0
MS	1,3-1,5
SVS	3,0
A	
B	

Observations

*Residual delivery
setting Idle setting
(LFG) as per VDT-I-
460135

Test Specifications

Distributor-type

Fuel-injection Pumps

NPP 001/4 FIA 1,9 d

2. Edition

En

VE 4/9 F 2300 L 157
Q 460 494 144
DHK: 1 688 901 022/130 bar

Test pressure line
6x2x450 mm / 1 680 750 073

supersedes 12.83
company Fiat
engine X8/48

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

mm

see VDT-W-460/...

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1500	4,4- 4,8 mm		
1.2 Supply-pump pressure	1500	5,1- 5,7 bar (kgf/cm ²)		
1.3 Full-load delivery with charge-air pressure	-	cm ³ /1000 strokes		
Full-load delivery without charge-air pressure	1500	33,0-34,0 cm ³ /1000 strokes		2,5(3,0)
1.4 Idle regulation	350	9,0-13,0 cm ³ /1000 strokes		2,0(3,0)
1.5 Full-speed regulation	2400	24,0-30,0 cm ³ /1000 strokes		
1.6 Start	100	min. 57,0 cm ³ /1000 strokes		
1.7 Load-dependent port-closing	1500			

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	800 0,7-1,5(0,4-1,8)	1500 (3,9-5,3)	2300 8,2-9,0(7,9-9,3)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	400 2,5-3,1	2300 6,9-7,5	
Overflow delivery	n = rev/min cm ³ /10 s	400 55-138 (40-153)	2300 55-138(40 - 153)	

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2600	3,0- 9,0 (2,0-10,0)	
	2500	14,0-20,0 (13,0-21,0)	
	2400	(23,0-31,0)	
	2300	34,8-37,2 (32,0-40,0)	
	1500	(31,2-35,8)	
	1000	32,7-35,3 (31,0-37,0)	
	600	34,0-37,0 (32,5-38,5)	
switch-off	2300	0	
Idle stop	450	max. 1,5	
	400	0,5 - 6,5	
	350	(7,0-15,0)	
End stop	300	min. 50,0	
	450	max. 46,0	
2.4 Solenoid	max. cut-in voltage	xxx min. 10 V	
	rated voltage	12V.	

3. Dimensions

Designation	for assembly and adjustment mm
K	3,1-3,4
KF	5,7-6,0
MS	1,4-1,65
SVS	2,8
A	
B	
Observations	

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Test Specifications

Distributor-type

Fuel-injection Pumps

WPP 001/4 FIA 2,7 a

1. Edition

VE 3/11F 1250 L 163-1
0 460 413 002

supersedes
company Fiat-Iveco
engine: 8035.06.200

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test instructions and Test Equipment

Pre-stroke setting 0,2 mm

see VDT-W-480/

Test ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	800	2,5 - 2,9 mm		
1.2 Supply-pump pressure	800	3,8 - 4,4 bar (kgf/cm ²)		
1.3 Full-load delivery with charge-air pressure	-	cm ³ /1000 strokes		
Full-load delivery without charge-air pressure	800	66,5 - 67,5 cm ³ /1000 strokes		3,5 (4,0)
1.4 Idle regulation	350	21,0 - 25,0 cm ³ /1000 strokes		3,5 (4,0)
1.5 Full-speed regulation	1400	12,0 - 18,0 cm ³ /1000 strokes		
1.6 Start	100	min. 80,0 cm ³ /1000 strokes		
1.7 Load-dependent port-closing	-			

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	600 1,0-1,8 (0,7-2,1)	800 (2,0-3,4)	1200 5,9-6,7 (5,6-7,0)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	400 2,0 - 2,6		1200 5,6 - 6,2
Overflow delivery	n = rev/min cm ³ /10 s			1250 55-138 (40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	1450 1400 1350 1250 800 500	max. 1,0 (10,5-19,5) 42,0-48,0 (40,5-49,5) 66,5-69,5 (65,3-70,7) (64,3-69,7) 56,5-59,5 (54,6-61,4)	

switch-off

Idle stop	475 425 350	max. 1,0 2,0 - 8,0 (0,5 - 9,5) (18,5 - 27,5)	
End stop	150 250	min. 90,0 max. 55,0	

2.4 Solenoid	max. cut-in voltage rated voltage	xxx min. 10V 12V
--------------	--------------------------------------	---------------------

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	-
KF	5,1 - 5,3
MS	1,5 - 1,7
SVS	4,3
A	
B	

Observations

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Test Specifications

Distributor-type

Fuel-injection Pumps

WPP 001/4 FIA 3,9 a

1. Edition

En

VE 4/11 F 1250 L 164

0 460 414 013

 supersedes -
 company: Fiat
 engine: 8045.05.200

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting 0,2 mm

see VDT-W-460/.

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	800	3,8- 4,2 mm		
1.2 Supply-pump pressure	800	3,7- 4,3 bar (kgf/cm ²)		
1.3 Full-load delivery with charge-air pressure	-		cm ³ /1000 strokes	
Full-load delivery without charge-air pressure	800	73,5-74,5 cm ³ /1000 strokes		3,5(4,0)
1.4 Idle regulation	350	21,0-25,0 cm ³ /1000 strokes		3,5(4,0)
1.5 Full-speed regulation	1350	29,0-35,0 cm ³ /1000 strokes		
1.6 Start	100	min. 80,0 cm ³ /1000 strokes		
1.7 Load-dependent port-closing	-			

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	500 1,3-2,1(1,0-2,4)	800 (3,3-4,7)	1250 7,6-8,4(7,3-8,7)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	500 2,3-2,9		1250 5,7-6,3
Overflow delivery	n = rev/min cm ³ /10 s	500 55-138(40-153)		1250 55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	1430 1390 1350 1250 800 500	max. 1,0 4,0-12,0(3,5-12,5) (27,5-36,5) 69,5-72,5(68,3-73,7) (71,3-76,7) 64,0-67,0(62,1-68,9)	
switch-off	1250	0	
Idle stop	500 425 350	max. 1,0 4,0-10,0(2,5-11,5) (18,5-27,5)	
End stop	150 250	min. 90,0 max. 65,0	

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	-
KF	5,4-5,6
MS	1,5-1,7
SVS	4,3
A	
B	

Observations

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Test Specifications

Distributor-type

Fuel-injection Pumps

WPP 001/4 FIA 3,6 b

1 Edition

En

VE 4/11 F 1250 L 164-1

0 460 414 015

supersedes-

company Fiat

engine: 80 45.06.200

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test instructions and Test Equipment

Pre-stroke setting

0,2

mm

see VDT-W-480/...

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	800	1,9- 2,3 mm		
1.2 Supply-pump pressure	800	3,7- 4,3 bar (kgf/cm ²)		
1.3 Full-load delivery with charge-air pressure	-	cm ³ /1000 strokes		
Full-load delivery without charge-air pressure	800	67,0-68,0 cm ³ /1000 strokes		3,5(4,0)
1.4 Idle regulation	350	23,0-27,0 cm ³ /1000 strokes		3,5(4,0)
1.5 Full-speed regulation	1350	29,0-35,0 cm ³ /1000 strokes		
1.6 Start	100	min. 90,0 cm ³ /1000 strokes		
1.7 Load-dependent port-closing				

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	600 0,2-0,8(0,0-1,2)	800 (1,4-2,8)	1100 4,9-5,5(4,5-5,9)	1250 5,3-6,1(5,0-6,4)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	600 2,9-3,5	1250 6,0-6,6		
Overflow delivery	n = rev/min cm ³ /10 s	300 55-138(40-153)	1250 55-138(40-153)		

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	1410 1380 1350 1250 800 500	max. 3,0 11,0-19,0(10,5-19,5) (27,5-36,5) 59,5-62,5(58,3-63,7) (64,8-70,2) 59,0-62,0(57,1-63,9)	
switch-off	1250	0	
Idle stop	480 425 350	max. 2,5 4,0-10,0(2,5-11,5) (20,5-29,5)	
End stop	150 250	min. 90,0 max. 60,0	

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	-
KF	5,2-5,4
MS	1,5-1,7
SVS	4,3
A	
B	

Observations

2.4 Solenoid

 max. cut-in voltage XX min. 10 V
 test voltage XXX rated voltage 12V.

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Test Specifications

Distributor-type

Fuel-injection Pumps

WPP 001/4 VMA 2.2 b

1. Edition

En

VE 4/10 F 2100 L 168

0 460 404 038

supersedes

company

VM Motori

engine

HR 492 HT

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

mm

see VDT-W-460/

1. Settings

	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1600	4,5 - 4,9 mm	0,8	
1.2 Supply-pump pressure	1600	5,6 - 6,2 bar (kgf/cm ²)	0,8	
1.3 Full-load delivery with charge-air pressure	1600	59,0 - 60,0 cm ³ /1000 strokes	0,8	3,0(3,5)
Full-load delivery without charge-air pressure	600	41,5 - 42,5 cm ³ /1000 strokes	0	
1.4 Idle regulation	400	16,0 - 20,0 cm ³ /1000 strokes	0	2,5(3,5)
1.5 Full-speed regulation	2300	27,0 - 33,0 cm ³ /1000 strokes	0,8	
1.6 Start	100	min. 55,0 cm ³ /1000 strokes	0	
1.7 Load-dependent port-closing	-	-	-	-

2. Test Specifications

checking values in brackets ()

2.1 Timing device LDA=0,8 bar	n = rev/min mm	1000 0,9-1,7(0,6-2,0)	1600 (4,0-5,4)	2100 7,0-7,8(6,7-8,1)
2.2 Supply pump LDA=0,8 bar	n = rev/min bar (kgf/cm ²)	400 1,5-2,1	2100 7,2-7,8	
Overflow delivery	n = rev/min cm ³ /10 s	500 55-138(40-153)	2100 55-138(40-153)	

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)	Designation	for assembly and adjustment mm
End stop	2400	max. 3,0	0,8	K	3,2-3,4
	2380	11,0-18,0(10,0-19,0)	0,8	KF	5,7-5,9
	2300	(25,5-34,5)	0,8	MS	0,7-0,9
	2100	51,8-54,2(48,5-57,5)	0,8	SVS	3,6
	1600	37,5-40,5(36,3-41,7)	0		
	1600	(56,8-62,2)	0,8		
	*700	50,0-51,0(47,1-53,9)	0,4		
	600	(38,6-45,4)	0		
switch-off	2100	0		A	
				B	
Idle stop	600	max. 1,0		Observations Manifold-pressure compensator stroke = 6,1 mm Correction at the adjusting nut. (46)	
	450	3,5-9,5(2,0-11,0)			
	400	(13,5-22,5)			
End stop	400	min. 52,0			
	500	max. 46,0			
2.4 Solenoid	max. cut-in voltage xx min 10 V 0,01-0,02 rated voltage 12V.				

3. Dimensions

for assembly
and adjustment
mm
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Test Specifications Distributor-type Fuel-injection Pumps

Testoil-ISO 4113

VE 4/8 F 2300 R 171
0 460 484 010

Test pressure line
6x2x450 mm / 1 680 750 073

supersedes Peugeot
company: XUD 7
engine:

DHK: 1 688 901 022/130 bar Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test instructions and Test Equipment

Pre-stroke setting

mm

see VDT-W-60V

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1250	3,8- 4,2 mm		
1.2 Supply-pump pressure	1250	4,3- 4,9 bar (kgf/cm ²)		
1.3 Full-load delivery with charge-air pressure	-	- cm ³ /1000 strokes		
Full-load delivery without charge-air pressure	1250	29,5-30,5 cm ³ /1000 strokes		2,5(3,0)
1.4 Idle regulation *	A 550	3,5- 4,5 cm ³ /1000 strokes		B 2,0(3,0)
1.5 Full-speed regulation	2400	19,0-25,0 cm ³ /1000 strokes		
1.6 Start	100	min. 42,0 cm ³ /1000 strokes		
1.7 Load-dependent port-closing	1250			

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	700 0,8-1,6(0,5-1,9)	1250 (5,3-4,7)	2000 8,0-8,8(7,7-9,1)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	700 2,8-3,4		2000 6,4-7,0
Overflow delivery	n = rev/min cm ³ /10 s			2300 55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2650 2500 2400 2250 2000 1250 700	max. 7,0 11,5-17,5 (10,5-18,5) (18,0-26,0) 28,0-30,0 (26,7-31,3) 29,0-31,0 (27,7-32,3) (27,7-32,3) 29,5-32,5 (28,0-34,0=	
switch-off	2300	0	
Idle stop	A 550 B 350 C 470	3,5 - 4,5 8,0 -12,0 (6,0-14,0) 8,0 -12,0 (6,0-14,0)	
End stop	250 500	min. 44,0 max. 34,0	

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	3,2-3,4
KF	5,2-5,5
MS	1,3-1,5
SVS	max. 3,0
A	
B	

Observations

*Residual delivery
setting Idle setting
(LFG) as per VDT-I-
460135

2.4 Solenoid	max. cut-in voltage test voltage	xx min 10 V xxxxxxx rated voltage 12V
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Test Specifications Fuel Injection Pumps ①A and Governors

40

WPP 001/4 MAN 9,7 1 4

1. Edition

En

PES 6 A 95 D 410 RS 2108 RSV 200-750 A 7 B 607 L

Komb.-Nr. 0 400 876 166

supersedes
company **MAN**
engine

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $1,7 - 1,8$
(1,65-1,85) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
750	10,8±0,1	10,4-10,6	0,3(0,6)			
200	6,0-6,2	0,9- 1,5	0,35(0,55)			

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

① Upper rated speed rev/min			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0	-	-	-	ca. 21	200	6,1	750	10,8-10,9
	x = 5,25						100	min. 19,5	400	10,8-11,0
ca. 49	9,8	790-800					200	6,0-6,2	250	11,9-12,5
②a	4,0	810-840					220-280	= 2,0		
	9 5	0,3-1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop		⑥ Rotational speed limit		③a Fuel delivery characteristics		Starting fuel delivery ⑤		④a Idle stop	
Test oil temp 40°C (104°F)		Note changed to 1							
rev/min 1	cm ³ /1000 strokes 2	rev/min 3		rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
750	103,5-105,5 (101,5-107,5)	790-800*	-	-	-	-	-	-	-

Checking values in brackets

* 1 mm less control rod travel than col 2

3.84

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①

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 KHD 15,8 k 1

40

1. Edition

En

PE 10 A 85 D 610/4 LS 2243 RQV 300-1150 AB 1040 DL

Komb.-Nr. 0 400 649 206

1-10-9- 4- 3 - 6 - 5 - 8 - 7 - 2

0-27-72-99-144-171-216-243-288-315° ± 0,5° (± 0,75°)

supersedes

company

engine

KHD

F 10 L 413

174 kW (238 PS)

/ 2300 min⁻¹

Combine harvester

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke ^{1,5-1,6}
(1,45-1,65) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	10,1+0,1	7,6-7,7	0,3(0,45)			
300	7,3-7,5	1,0-1,6	0,2(0,4)			

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1150	15,2-17,8	-	-	-	ca. 12	100	min. 7,5	250	0,7-1,1
ca. 64	9,1 4,0 1400	1190-1200 1240-1270 0-1,0					300 590- 750	5,9-6,1 650=2,0 max. 1,0	550 850 1150	2,6-2,8 4,4-4,7 7,5

Torque control travel a = 0,8 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2)		Rotational-speed limitation intermediate speed (2b)	Fuel delivery characteristics high idle speed (5a)		Starting fuel delivery idle switching point (6)		Torque-control travel (5)	
rev/min 1	cm³/1000 strokes 2	rev/min 3	rev/min 4	cm³/1000 strokes 5	rev/min 6	cm³/1000 strokes 7	rev/min 8	Control rod travel mm 9
1150	76,0-77,0 (74,0-79,0)	1190-1200*	1000	82,0-85,0 (80,0-87,0)	100	14,1-15,1 mm RW	1150	10,1+0,1
			900	81,0-84,0 (79,0-86,0)			975	10,3+0,2
							925	10,7+0,2
							500	11,0+0,1

Checking values in brackets

* 1 mm less control rod travel than col. 2

2 R4

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 MB 5,7 q 7

1. Edition

En

PES 6 A 90 D 410 RS 2293 Z RSV 350-1300 A 0 B 1101 DL
1101-2L

Komb.-Nr. 0 400 876 257

Supersedes:

Company Daimler-Benz

Engine OM 352

70 kW (95 PS)

Unimog

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,15-2,25
(2,10-2,30) mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning torque-control valve mm
1	2	3	4	2	3	6
1300	8,2-8,3	4,5 - 4,6	0,3(0,45)			
350	7,0-7,2	1,0 - 1,4	0,2(0,4)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
loose	800	0,3-1,0	-	-	-		350	7,1	1300	8,2-8,3
	x = 5,0								500	9,6-9,7
ca. 66	7,2	1340-1350					100	min. 19,0	700	9,3-9,5
	4,0	1395-1425					350	7,0-7,2	1100	8,5-8,8
2a	1500	0,3-1,7					465-525 = 2,0			

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational speed limit		3a Fuel delivery characteristics		Starting fuel delivery		4a Idle stop	
Test oil temp. 40°C (104°F)		Note changed to 1 rev/min				Idle			
rev/min	cm ³ /1000 strokes			rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3		4	5	6	7	8	9
1300	44,5-45,5 (42,5-47,5)	1340-1350*		500	42,0-45,0 (40,0-47,0)	100	78,0-88,0 (75,0-91,0)		

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.84

A21

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A21

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 FAL 7,4 a

1. Edition

En

BR-PES6A 90 C 410 RS 2361 EP/RSV 250-1150 A1B 1015 L
BR-PES6A 90 D 410 RS 2361

superseded
company Fiat-Allis
engine CP3/720

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (2,15-2,25) mm (from BDC)
(2,10-2,30)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1 000	9,0	5,9-6,4	0,4			
1 000	6,0	2,7-3,5				
1 000	15,0	13,3-14,3				
200	9	0,2-0,3				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca. 66	1 150	16,0				ca. 27	250	6,0	1 130	0
	1 210	10,4					100	19,0-21,0	450	0
	1 250	5,7	without auxiliary spring				250	5,7- 6,3	300	1,2-1,8
	1 220	7,8-11,0	with auxiliary spring				330	4,2- 5,0		
2a	1 250	4,0- 7,3					400	2,0- 3,9		
	1 300	0,8- 3,0					600	0 - 1,0		
	1 400	0,3 - 1,0								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limit		3a Fuel delivery characteristics		Starting fuel delivery idle		5 Idle stop	
Test oil temp 40°C (104°F)		Note changed to rev/min							
rev/min	cm ³ /1000 strokes	3	4	5	6	7	8	9	
1	2								
1 130	78,0-80,0	1170-1190*	-	-	100	min. 129,0	-	-	

Checking values in brackets

* 1 mm less control rod travel than col 2

2.84

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Test Specifications Fuel Injection Pumps 1A and Governors

40

WPP 001/4 KHD 6,1 e
7. Edition

En

PES 6 A 95 D 410 RS 2471 RSV 325-1150 A 8 B 707 DL

Komb.-Nr. 0 400 876 274

supersedes 6.83
company KHD
engine BF6L 913 C
132 kW
Einbau 2300

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,9 - 2,0 mm (from BDC)
(1,85-2,05)

Testoil-ISO 4113

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	11,8±0,1	10,8-11,0	0,3(0,6)			
325	7,1-7,3	0,9-1,5	0,3(0,5)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
loose	800	0,3 - 1,0 x = 4,75	-	-	-	ca. 21	325	6,7	1150	11,8-11,9
ca. 55	10,8	1190-1200					100	min. 19,0	500	11,8-12,0
2a	4,0	1235-1265					325	7,1-7,3		
	1400	0,3-1,7					590-650	= 2,0		

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limit		3a Fuel delivery characteristics		Starting fuel delivery 5		4a Idle stop	
Test oil temp 40°C (104°F)		Note changed to 1 rev/min				Idle			
rev/min 1	cm ³ /1000 strokes 2	3	rev/min 4	cm ³ /1000 strokes 5		rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
LDA 150	0,7 bar 108,0-110,0 (106,0-112,0)	1190-1200*	LDA 850	0,7 bar 102,5-105,5 (100,0-108,0)		100	125,0-135,0 (122,0-138,0) = 15,5 - 15,8 mmRW	-	-
			LDA 500	0 bar 62,0-64,0 (59,5-66,5)					

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.84

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D. Adjustment Test for Manifold Pressure Compensator

KHD 6,1 e

- 2 -

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting	Measurement		Control rod travel - diminution difference	
	Gauge pressure =	bar	Gauge pressure =	bar	mm (1)
PES 6 A..RS 2471 + RSV..A 8 8707DL	0,70		0,37		11,8-11,9
			0,09		11,5-11,6
			0		10,1-10,3
					9,9-10,1

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps and Governors

40

WPP 001/4 MAN 11,1 h

4. Edition

En

Testoil-ISO 4113

PES 6 A 95 B 410 LS2485 RQV 250-1100 AB850D (1)
LS2485Z RQV 250-1100 AB850D (2)
LS2485 RQV 750 AB955 (3)

supersedes
company M A N
engine D 2566 M..
(1 - 240 PS)
(2 - 220PS-Saviem)
(3 - Aggregat)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $1,50-1,60$
($1,45-1,65$) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery 2485 cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery 2485Z cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	11,7+0,1	12,3 - 12,5	0,3(0,6)	11,0+0,1	11,2 - 11,4	
250	5,9-6,1	1,1 - 1,7	0,3(0,5)	5,6-5,8	0,9 - 1,5	

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

2485 mit 850D (1)

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel Torque-control travel	
Degree of deflection of control lever 1	rev/min 2	Control rod travel mm 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 50	1140	14,4-17,6	-	-	-	ca. 13	100	7,5-10,2	200	0,5-2,2
	1200	4,0-10,6					200	5,7-8,5	600	3,8-4,1
	1220	0 - 8					300	2,5-5,3	1140	8,3
	1300	0 - 1					410	0	1140	0
									550	0,4-0,6

Torque control travel a - 0,5 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational speed limitation	Fuel delivery characteristics		Starting fuel delivery Idle switching point		Intermediate rotational speed Torque-control travel	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	mm 9
1100 (1)	123,0-125,0 (121,0-127,0)	1140-1150 *	500	113,5-118,5 (111,5-120,5)	100	108,5-116,5 - 12,6-13,0 mm RW	-	-
					250	6,0 mm RW		
					130-190(120-200)			./.

Checking values in brackets

* 1 mm less control rod travel than col. 2

B1

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3.84

B. Governor Settings

2485 Z + RQV..850 D

MAN 11,1 h

-2-

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel		
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm	
1	2	3	4	5	6	7	8	9	10	11	
max.	1140	14,4-17,6	-	-	-	ca.13	100	min. 7,4	200	0,7-0,9	
ca.42	10,0	1140-1150						250	5,6-5,8	500	3,5-3,8
	4,0	1175-1205						310-370	=2,0	800	4,9-5,4
	1300	0-1,0						450	max.1,0	1100	7,7

Torque control travel a = 0,5 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
1100 (2)	111,5-113,5 (109,5-115,5)	1140-1150*	800 500	114,5-118,5 (112,5-120,5) 111,5-113,5 (109,5-115,5)	100	13,7-14,3 mm RW	1100 800 500	11,0+0,1 11,4+0,2 11,5+0,1

Checking values in brackets

* 1 mm less control rod travel than col 2

Testoil-ISO 4113

B. Governor Settings

2485 + RQV..955

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 29	725 750 770 800	16,0-22,0 9,3-13,8 2,5-11,0 0	-	-	-	-	-	-	750	4,6

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F) ②		Rotational-speed limitation intermediate speed ④a	Fuel delivery characteristics high idle speed ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control travel Control rod travel mm ⑤	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min		rev/min	
1	2	3	4	5	6	7	8	9
725 (3)	122,5-124,5 (120,5-126,5)	765-770*	-	-	- 200	- 7,0-11,0	-	-

Checking values in brackets

* 1 mm less control rod travel than col 2

②

Test Specifications Fuel Injection Pumps ② and Governors

40

WPP 001/4 MAN 11,1 g
3. Edition

En

PES 6 A 95 D 410 LS 2485 RQ 250/1100 AB 965 DI
Komb.-Nr. 0 400 846 372

supersedes 11.82
company: MAN
engine: D 2566 M/MF

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke (1,45-1,65) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	11,7+0,1	12,3-12,5	0,3(0,6)			
250	6,0-6,2	1,1- 1,7	0,3(0,5)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
Setting point		Test specifications				Test specifications				Control rod travel	
rev/min 1	Control rod travel mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
600	15,6-16,4	600	16,0	10,7 4,0	1145-1160 1185-1215	250	6,1	100 150 360-420 500	min. 7,5 6,0 -6,2 =2,0 max. 1,0	-	-

Torque-control travel on flyweight assembly dimension a = mm Speed regulation: At 1145-1160 min⁻¹ 1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop		Fuel delivery characteristics		Starting fuel delivery Idle speed	
rev/min 1	cm ³ /-1000 strokes 2	rev/min 3	Control rod travel mm 3a	rev/min 4	cm ³ /-1000 strokes 5	rev/min 6	Control rod travel mm 7 Control rod travel mm 6
1100	123,0-125,0 (121,0-127,0)	-		500	113,5-118,5 (111,5-120,5)	100	108,5-116,5 (105,5-119,5) = 12,6-13,0 mm RW

Checking values in brackets

3.84

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B3

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 KHD 4,1 c 1

1. Edition

En

PES 4 A 80 D 410/3 RS 2523
Komb.-Nr. 0 400 864 044

RSV 325-1400 A 8 B 540DL

supersedes

company KHD

engine F 4 L 912

Einbau 2800

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $\begin{matrix} 1,9 - 2,0 \\ (1,85 - 2,05) \end{matrix}$ mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1380	10,2+0,1	5,7-5,8	0,2(0,35)			
325	8,0-8,2	0,9-1,5	0,2(0,3)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0	-	-	-	ca. 19	325	7,6	1380	10,2-10,3
	x=						100	min. 19,5	900	10,8-11,1
ca. 67	9,2	1420-1430					325	8,0-8,2	500	11,4-11,5
2a	4,0	1450-1480					670 - 730	=2,0		
	1600	0,3 - 1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limit		3a Fuel delivery characteristics		Starting fuel delivery idle		4a Idle stop	
Test oil temp. 40°C (104°F)		Note changed to							
rev/min 1	cm ³ /1000 strokes 2	rev/min 3		rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
1380	57,0-58,0 (55,5-59,5)	420-1430*	-	-	-	-	-	-	-

Checking values in brackets

* 1 mm less control rod travel than col 2

B4

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Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 KHD 6,1 d

2. Edition

En

Testoil-ISO 4113

PES 6 A 80 D410/3 RS2527 EP/RSV 325-1150 A8 B2014DL

Komb.-Nr. 0 400 866 084

supersedes 1.78

company:

engine: K H D

F6 L912

75kW (102PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

 Port closing at prestroke $\frac{1,90-2,00}{(1,35-2,05)}$ mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery 2527 cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	11,8 +0,1	5,6 - 5,7	0,2(0,35)			
325	8,9-9,1	0,8 - 1,2	0,2(0,3)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever 1	rev/min 2	Control rod travel mm 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
loose	300	0,3-1,0				ca. 23	325	8,5	1150	11,8+0,1
							100	min. 19,5	950	12,0+0,2
							325	8,9-9,1	775	12,5+0,2
							390-450	= 2,0	450	12,5+0,2
ca. 58 ⑤	10,8 4,0 1350	1190-1200 1235-1265 0,3-1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

② Full-load stop		⑥ Rotational-speed limit		③a Fuel delivery characteristics		Starting fuel delivery idle		⑤a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ... rev/min							
rev/min 1	cm ³ /1000 strokes 2	rev/min 3		rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
1150	56,0 - 57,0 (54,5 - 58,5)	1190-1200 *		775	54,0 - 56,0 (52,0 - 58,0)	-	-	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.84

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Test Specifications Fuel Injection Pumps ①A and Governors

40

WPP 001/4 KHD 6,1 d 1
1. Edition

En

PES6A 85 D 410 RS 2537 RSV 325-1150 A8B2020 DL
Komb.-Nr. 0 400 876 270 A8C2020 DL

supersedes
company KHD
engine BF 6 L 913
97 kW/2300 min⁻¹ (1)
Schlepper DX145-S15
107kW/2300 min⁻¹ (2)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,85-2,85 mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1150	11,0+0,1	8,0-8,2	0,3(0,45)			
325	6,8-7,0	1,0-1,6	0,2(0,4)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

① Upper rated speed rev/min			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
loose	800	0,3-1,0	-	-	-	ca. 21	325	5,0		
							100	min. 19,5		
ca. 55	10,0	1190-1200					325	5,4-5,6		
							510-570	= 2,0		
②a	4,0	1225-1255								
	1350	0,3-1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop		⑥ Rotational-speed limit		③a Fuel delivery characteristics		Starting fuel delivery ⑤		④a Idle stop	
Test oil temp 40°C (104°F)		Note changed to 1 rev/min				Idle		Control rod travel mm	
rev/min	cm ³ /1000 strokes	3		rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	mm
1	2			4	5	6	7	8	9
(1) LDA 1150	0,7 bar 77,0-78,0 (75,0-80,0)	1190-1200*		LDA 650	0,3 bar 77,0-79,0 (74,5-81,5)	100	120,0-130,0	-	-
LDA 800	0,5 bar 78,0-81,0 (75,5-82,5)			LDA 500	0 bar 61,0-63,0 (58,5-65,5)				

Checking values in brackets

* 1 mm less control rod travel than col 2
2.84

B6

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B. Governor Settings

① Upper rated speed			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
loose	800	0,3-1,0				ca. 21	325	4,9-5,1	1150	11,0+0,1
							100	min. 19,5	750	12,4+0,2
							325	5,4-5,6	450	12,5+0,2
ca. 55	10,0	1190-1200					510-570	= 2,0		
⑤	4,0	1225-1255					700	0 - 1		
	1350	0,3-1,7								

C. Settings for Fuel Injection Pump with Fitted Governor

② Full-load stop		⑥ Rotational speed limitation Note: changed to rev/min	③a Fuel delivery characteristics		Starting fuel delivery idle		⑤a Idle stop	
Test oil temp. 40°C (104°F)								
rev/min	cm ³ /1000 strokes		rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	
(2) LDA	0,7 bar		LDA	0,7 bar	100	120,0-130,0	-	-
1150	79,5 - 81,5 (77,5 - 83,5)	1190-1200*	800	88,0 - 91,0 (86,0 - 93,0)		(117,0-133,0) = 17,4-18,0 mm RW		
			⑥a LDA	0 bar 60,0 - 63,0 (58,0 - 65,0)				

Checking values in brackets

*1 mm less control rod travel than col. 2

Testoil-ISO 4113**D. Adjustment Test for Manifold Pressure Compensator**

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure (g.p.)

Pump/governor	Setting (g.p.)	Measurement (g.p.)	Control rod travel mm (1)
2537 mit 2020DL	0,70	0,37 0,09 0	12,5 - 12,3 12,2 - 12,3 10,5 - 10,9 10,6 - 10,7

Notes:

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 HAN 10,8 f 1

1. Edition

En

PE 4 A 95 D 420 RS 2556
Komb.-Nr. 0 400 674 042

RSV 350-1100 A 8 B 1120 R
A 8 C 1120 R

supersedes
company MF-Hanomag
engine D 943

1-2-4-3 je 90 ° ± 0,5 ° (± 0,75 °)

** Cold-start test according to VDT-I-420/114
All test specifications are valid for Bosch Fuel Injection Pump test Benches and testers

A. Fuel Injection Pump Settings

Port closing at prestroke (2,15-2,25)
(2,10-2,30) mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1100	10,0±0,1	9,3-9,5	0,3 (0,6)			
400	7,9-8,1	1,4-2,0	0,3 (0,5)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
loose	800	0,3-1,0	-	-	-	ca. 21	400	7,5	1100	10,0-10,1
	x = 3,75						100	min. 19,0	1005	10,4-10,6
							400	7,9-8,1	500	10,9-11,0
ca.52	9,0	1140-1150					580-640	2,0		
2a	4,0	1205-1235					600	max. 1,0		
	1345	0,3-1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limit		3a Fuel delivery characteristics		Starting fuel delivery Idle		5 Idle stop	
Test oil temp 40°C (104°F)		Note changed to) rev/min							
rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	
1100	93,0-95,0 (91,0-97,0)	1140-1150*	700	100,0-103,0 (98,0-105,0)	100	19,0-21,0 mm RW	-	-	
			500	92,0-94,0 (90,0-96,0)		**			

Checking values in brackets

* 1 mm less control rod travel than col 2

12.83

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Testoil 150 4113

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 HAN 10,8 f 2

1. Edition

En

PE 4 A 95 D 420 RS 2556
Komb.-Nr. 0 400 674 043

EP/RSV 350-1100 A 8 B 1121 DR

supersedes

company MF-Hanomag

engine D 943

1-2-4-3 je 90 ° ± 0,5 ° (± 0.75 °)

** Cold-start test according to VDT-I-420/114

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Testoil-ISO 4113

Port closing at prestroke (1,8-1,9) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	9,9±0,1	8,8-9,0	0,3 (0,6)			
350	6,7-6,9	1,4-2,0	0,3 (0,5)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min Degree of deflection of control lever 1			Intermediate rated speed 4 5 6			4 Lower rated speed Control-lever deflection in degrees rev/min 7 8 9			3 Torque control rev/min 10 11	
	Control rod travel mm 2	Control rod travel mm rev/min 3								
lose	800	0,3-1,0 x = 4,5	-	-	-	ca. 21	350	5,5	1100	9,9-10,0
ca.52	8,9	1140-1150					100	min. 19,0	1010	10,3-10,5
	4,0	1160-1190					350	5,9-6,1	500	10,8-10,9
(2a)	1340	0,3-1,7					480-540	= 2,0		
							600	max. 1,0		

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp 40°C (104°F) rev/min 1		6 Rotational-speed limit Note changed to rev/min 3		3a Fuel delivery characteristics rev/min 4		Starting fuel delivery Idle rev/min 6		5 Idle stop rev/min 8	
	cm ³ /1000 strokes 2				cm ³ /1000 strokes 5		cm ³ /1000 strokes 7		Control rod travel mm 9
1100	87,5-89,5 (85,5-91,5)	1140-1150*	700	91,5-94,5 (89,5-96,5)	100	19,0-21,0 mm RW **		-	-
			500	83,0-85,0 (81,0-87,0)					

Checking values in brackets

* 1 mm less control rod travel than col 2

12.83

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②

Test Specifications Fuel Injection Pumps ② and Governors

40

WPP 001/4 DAO 9,7a

1. Edition

En

PES 6 A 95 D 410 RS 2679 RQ 200/1100 AB 860 DL
Komb.-Nr. 0 400 846 529

supersedes ..

company: Daewoo

engine: D 2156 MT

169 kW

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $1,95-2,05$ mm (from BDC) RW = 19,5-21,0 mm
(1,90-2,10)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1100	10,5+0,1	12,7-12,9	0,35 (0,6)			
200	5,9-6,1	1,2-1,8	0,35 (0,55)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
①		Setting point		Test specifications		Setting point		Test specifications		③	
rev/min	Control rod travel mm	rev/min	Control rod travel mm	Control rod travel mm	rev/min	rev/min	Control rod travel mm	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11	12
600	19,2-20,8	600	20,0	9,5	1145-1160	200	6,0	100	min. 7,3	1100	10,5-10,6
VA =	max. 46 °			4,0	1180-1210			200	5,9-6,1	600	10,7-10,8
								340-350	= 2,0	1025	10,6-10,8

Torque-control travel on flyweight assembly dimension a = 0,1 mm

Speed regulation: At 1145-1160 min⁻¹

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop		Fuel delivery characteristics		Starting fuel delivery Idle speed	
②		③a		③b		⑥	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes/mm
1	2	3	4	5	6	7	
LDA	0,7 bar	200	LDA	0,7 bar	100	179,0-189,0	
1100	127,0-129,0		800	130,5-133,5		(176,0-192,0)	
	(125,0-131,0)			(128,0-136,0)		= 16,2-16,8 mm	
			LDA	0 bar		RW	
			500	81,5-83,5			
				(79,5-85,5)			

Checking values in brackets

2.84

B10

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5.10

D. Adjustment Test for Manifold Pressure Compensator

DAO 9,7 a

- 2 -

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting	Measurement		Control rod travel - diminution difference (1)
	Gauge pressure = bar	Gauge pressure = bar	mm	
PES 6 A..RS2679 + RQ.. AB 860DL	0,70	0 0,29 0,24		10,8-10,9 8,8-9,0 10,1-10,2 9,2-9,4

Notes:

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps **(1A)** and Governors

40

WPP 001/4 HAN 10,8 f

6. Edition

En

PE 6 A 100 D 320 RS 3030
Komb.-Nr. 0 401 076 006

EP/RSV 350-1100 A 8 B 1119 DR^{superseded} 6.82

company MF-Hanomag
engine D 963 A 2

** Cold-start test according to VDT-I-420/114

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke ^{1,8-1,9}
(1,75-1,95) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	11,5+0,1	15,0-15,2	0,3 (0,6)			
350	6,4-6,6	1,3-1,9	0,3 (0,5)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

① Upper rated speed rev/min			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0	-	-	-	ca. 24	350	5,5	-	-
ca. 56	x = 5,5						100	min. 19,0		
	10,5	1140-1150					350	5,9-6,1		
	4,0	1210-1240					435-495	= 2,0		
②a	1355	0,3-1,7					600	0-1,0		

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop		⑥ Rotational-speed limit		③a Fuel delivery characteristics		Starting fuel delivery Idle		④a Idle stop	
Test oil temp. 40°C (104°F)		Note changed to) rev/min							
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9	
1100	150,0-152,0 (148,0-154,0)	1140-1150*	-	-	100	19,0-21,0 mm RW **	-	-	

Checking values in brackets

* 1 mm less control rod travel than col. 2

12.83

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Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4

6. Edition

supersedes 9.82

company: RVI

engine: MIDR06.02-12
125 kW (170 PS)

Testoil-SU 4113

PES 6 MW 100/320 RS 1016
RQV 300 - 1400 MW 25-1
Komb. 0 403 446 122

1 - 5 - 3 - 6 - 2 - 4 je 60° * Start-of-delivery mark 8° after start of
delivery with control-rod travel 10.5 mm

* All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (2,95-3,15) mm (from BDC) PW 9,0-12,0 mm
3,00-3,10

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1400	11,1+0,	9,15-9,35	0,35(0,6)			
300	6,2-6,8	0,95-1,35	0,35(0,55)			
900	11,1+0,		0,5 (0,7)			
500	9,7-9,8		0,35(0,6)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
max.	1400 1700	15,2-17,8 0 - 1,0				ca. 12	200 300	min. 7,5 5,8-5,9		
ca. 62	10,1 4,0	1455-1465 1575-1605				③a	490-550 = 2,0			

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
LDA 1400	0,5 bar 91,5-93,5 (89,5-95,5)	1455-1465*	LDA 900	0,5 bar 87,5-91,5 (85,5-93,5)	100 300	94,0-104,0 9,5-13,5 (7,0-16,0)		
			LDA 500	0 bar 56,0-58,0 (53,5-60,5)	100-230	(80-250)		

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.84

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D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel diminution difference mm (1)
PS 1016 with MW 25-1	0,23	0,5 0,20 0	10,7 - 10,9 11,1 - 11,2 10,2 - 10,3 9,7 - 9,8

Notes

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Testoil-ISO 4113

①

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 RVI 8,8 f

3. Edition

En

Testoil-ISO 4113

 PES 6 MW 100/320 RS 1016
 0 403 446 129

ROV 300-1400 MW 25-2

supersedes

10.83

company

RVI

engine

MIDR 06.02-12

125 kW (170 PS)

 1 - 5 - 3 - 6 - 2 - 4
 0 - 60 - 120 - 180 - 240 - 300

 * Start-of-delivery mark 8° after start of
 delivery with control-rod travel 10.5 mm

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (2,95-3,15) mm (from BDC) RW 9,0-12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1400	11,1+0,1	9,1 - 9,3	0,35(0,6)			
300	5,8-5,9	0,95-1,35	0,35(0,55)			
900	11,1+0,1		0,5 (0,7)			
500	9,3+0,1		0,35(0,6)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1400 1700	15,2-17,8 0 - 1,0	-	-	-	ca.13	300 200	5,8-5,9 max. 7,5		
ca.62	10,1 4,0	1455-1465 1575-1605				3a	490-550 = 2,0			

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed 4a	Fuel delivery characteristics high idle speed 5a		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
LDA 1400	0,5 bar 91,0-93,0 (89,0-95,0)	1455-1465*	LDA 900	0,5 bar 86,0-90,0 84,0-92,0	100	94,0-104,0 (91,0-107,0)		
			LDA 500	0 bar 52,0-54,0 50,0-56,0	300	9,5-13,5 (7,0-16,0)		
					100-230	(80-250)		

Checking values in brackets

* 1 mm less control rod travel than col. 2
1.84

B15

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D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting	Measurement		Control rod travel - diminution difference mm (1)
	Gauge pressure - bar	Gauge pressure - bar		
PS 1016 with RQV..MW 25 - 2	0,12			9,9 - 10,0
		0,16		10,7 - 10,8
		0		9,4 - 9,5
		0,5		11,1 - 11,2

Notes

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Testoil-ISO 4113

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 BET 12,8 b

1. Edition

En

PE 6 P 90/320 RS 136

EP/RSV 250-1100 P 1/338 R

supersedes -

company

engine

Berliet

M 635-40-C

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

2,0-2,1

Port closing at prestroke

(1,95-2,15)

mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre tensioning (torque-control valve) mm 6
1000	12,0	9,3 - 10,0	0,8			
600	9,0	3,2 - 4,4				
600	12,0	7,6 - 8,8				
600	15,0	12,8 - 14,3				
200	9,0	1,4 - 2,4				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
ca. 60	1100	16,0	without auxiliary spring			ca. 26	250	8,5	750	0
	1150	11,4					100	19,0-21,0	400	0
	1180	7,4					250	8,2- 8,8	280	1,2-1,8
	1150	10,0-12,0	with auxiliary spring				400	1,8- 4,4		
2a	1220	3,5- 5,9					560	0 - 1,0		
	1340	0 - 1,0								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational speed limit		3a Fuel delivery characteristics		Starting fuel delivery Idle		4a Idle stop	
Test oil temp 40°C (104°F)		Note changed to 1 rev/min							
rev/min 1	cm ³ /1000 strokes 2	3	4	5	6	7	8	9	10
750	117,0-119,0	1120 1160: 1 - 3 mm RW less than column 2	-	-	100	mind. 18,5 mm RW	250	20,0-26,0	
					High idle speed 1200	max. 38,0			

Checking values in brackets

* 1 mm less control rod travel than col 2

2.84

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B17

517

Test Specifications Fuel Injection Pumps ① and Governors

VDT-WWP 001/4 BET 12.8 c

1. Edition

En

PES 8 P 110/321 RS 193

RQV 250-1250 PA 133 R

supersedes -
company Berliet
engine V 825

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $2,4 - 2,5$
(2,35-2,55) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12,0	11,5-12,1	0,4			
600	9,0	4,7- 6,1				
600	12,0	10,8-12,4				
600	15,0	20,3-22,5				
200	9,0	4,9- 6,5				

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 68	1275 1340 1400 1460	12,5-13,5 5,5-10,5 0- 5,2 0	-	-	-	ca. 12	180 300 500 800	7,4-8,0 3,8-4,8 2,2-3,7 0	1200	7,6
						③a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
750	91,0-94,0	1270 1290:0,5-1,5 mm RW less than column 2	-	-	100	180,0-210,0	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

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Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 BET 12,8 a

1. Edition

En

PE 6 P 90 A 320 RS 225

EP/RSV 250-1100 P 1/338 R

supersedes

company

engine

Berliet

M 635-40-E

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,0-2,1
(1,95-2,15) mm (from BDC)

Testoil-ISO 4113

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque control valve) mm 6
1000	12,0	9,4-9,9	0,8			
600	9,0	3,2-4,4				
600	12,0	8,3-9,5				
600	15,0	13,5-15,0				
200	9,0	2,3-3,3				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
ca. 60	1100	16,0	without auxiliary spring			ca. 26	250	8,5	750	0
	1150	11,4					100	19,0-21,0	400	0
	1180	7,4					250	8,2- 8,8	280	1,2-1,8
2a	1150	10,0-12,0	with auxiliary spring				400	1,8- 4,4		
	1220	3,5- 5,9					560	0- 1,0		
	1340	0- 1,0								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational speed limit		3a Fuel delivery characteristics		Starting fuel delivery idle		5 Idle stop	
Test oil temp 40°C (104°F)		Note changed to) rev/min		rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
rev/min 1	cm ³ /1000 strokes 2	3		4	5	6	7	8	9
750	122,0-124,0	1120 1160: 1-3 mm RW less than column 2		-	-	100	mind. 18,5 mm RW High idle speed max. 38,0	250	20,0-26,0

Checking values in brackets

* 1 mm less control rod travel than col 2

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2.84

Test Specifications

Fuel Injection Pumps (1A)

and Governors

40

WPP 001/4 BET 12,8 a 1

1. Edition

En

PE 6 P 90 A 320 RS 225 Z EP/RSV 250-1100 P1/338 R

supersedes -

company Berliet

engine M 635-40-C

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,0-2,1 mm (from BDC)
(1,95-2,15)

Testoil-ISO 4113

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12,0	9,3 - 10,0	0,8			
600	9,0	3,2 - 4,4				
600	12,0	7,6 - 8,8				
600	15,0	12,8 - 14,3				
200	9,0	1,4 - 2,4				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
ca. 60	1100	16,0	-	-	-	ca. 26	250	8,5	750	0
	1150	11,4	without auxiliary spring				100	19,0-21,0	400	0
	1180	7,4					250	8,2-8,8	280	1,2-1,8
2a	1150	10,0-12,0	with auxiliary spring				400	1,8-4,4		
	1220	3,5- 5,9					560	0- 1,0		
	1340	0- 1,0								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational speed limit		3a Fuel delivery characteristics		Starting fuel delivery 5		4a Idle stop	
Test oil temp 40°C (104°F)		Note changed to 1 rev/min				Idle			
rev/min 1	cm ³ /1000 strokes 2	3	4	5	6	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
750	117,0-119,0	1120 1160:1-3 mm RW less than column 2	-	-	100	mind. 18,5 mm RW	250	20,0- 26,0	
					High 1200	idle speed max. 38,0			

Checking values in brackets

* 1 mm less control rod travel than col 2

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2.84

B20

520

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 ALO 13,8 •

1. Edition

En

PE 6 P 120 A 420 LS 314 RQV 300-875 PA 313 KR
Komb.-Nr. 0 401 846 348

supersedes
company Allis Chalmers
engine 25000

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $\frac{2,8-2,9}{(2,75-2,95)}$ mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
875	8,2-8,3	16,1-16,3	0,5			
300	4,9-5,1	1,8-2,4	1,0			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min 2	Control rod travel mm 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 66	875 900 950 990 1060	15,0-17,7 12,2-15,6 6,0-11,1 0-7,0 0	-	-	-	ca. 10	100 250 300 400 490 550	6,6-8,0 3,8-6,0 2,2-4,6 1,2-2,5 0-1,2 0	-	-

Torque control travel a = 0,2 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) 2		Rotational-speed limitation intermediate speed 4a	Fuel delivery characteristics high idle speed 5b		Starting fuel delivery idle switching point 6		Torque-control travel 5	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
875	161,0-163,0 (159,0-165,0)	915-925*	600	146,0-150,0 (144,0-152,0)	100 300	130,0-170,0 18,0-24,0	875 600	8,2-8,3 8,4-8,5

Checking values in brackets

* 1 mm less control rod travel than col. 2

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Testoil-ISO 4113

①

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 VOL 7,0 e
7. Edition
En

Testoil-ISO 4113

PE 6 P 110 A 320 RS 367
RS 367Z
RS 367Y

RQV 250-1200 PA394/2R (1)
PA394/2R (2)
PA394/2R (3)

supersedes 7.83
company Volvo
engine TD 70 F
(1-174kW-237PS)
(2-155kW-210PS)
(3-180kW-245PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $\frac{3,00-3,10}{(2,95-3,15)}$ mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	11,9+0,1	12,2 - 12,4	0,4(0,8)	10,9+0,1	10,0 - 10,2	2,5 [±] 0,1** (max.2,2-2,9)
250	4,7-4,8	1,1 - 1,5	0,3(0,6)	4,7-4,8	1,1 - 1,5	

Adjust the fuel delivery from each outlet according to the values in

** In case valve-spring spread is higher, change the initial tension accordingly.

B. Governor Settings

(1)

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1200	15,2-17,8	-	-	-	ca. 11	100	min. 6,2	200	0,3-1,2
ca. 66	10,9	1260-1270					250	4,7-4,9	1230	8,2
	4,0	1370-1400					350-450	=2,0		
	1500	0 - 1,0				3a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ④a	Fuel delivery characteristics high idle speed ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
(1) 700	LDA 0,7 bar 122,0-124,0 (119,0-127,0)	1260-1270*	LDA 700	0 bar 78,5 - 80,5 (75,5 - 83,5)	100	160 - 200 (156-204) 11-15)** Streug.max.3	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

2.84

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B. Governor Settings

367Z (2)

VOL 7,0 e

- 2 -

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	(1a) Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	(3) rev/min	(1) mm
1	2	3	(2a)	4	5	6	7	8	9	10
max.	1200	15,2-17,8	-	-	-	-	ca.12	100 250	min.6,5 4,7-4,8	200 1230
ca.67	9,9 4,0 1450	1265-1275 1360-1385 0 - 1,0					(3a)			0,3-1,2 8,2

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed	Starting fuel delivery idle switching point	Torque-control travel
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min
1	2	3	4	5	6
700	LDA 0,7 bar 100,0-102,0 (97,0-105,0)	1265-1275*	LDA 700 78,5 - 80,5 (75,5 - 83,5)	100 : 165,0-200,0 = 20,0-21,0 mm RW 250 : 11 - 15 Streuug. max. 3)**	-

Checking values in brackets

* 1 mm less control rod travel than col 2

B. Governor Settings

367Y (3)

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	(1a) Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	(3) rev/min	(1) mm
1	2	3	(2a)	4	5	6	7	8	9	10
ca.68	1200 1450	15,2-17,8 0-1				ca.12	100 250	min. 6,3 4,7-4,8		
ca.68	11,3 4,0	1240-1250 1355-1390				(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed	Starting fuel delivery idle switching point	Torque-control travel
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min
1	2	3	4	5	6
LDA 700	0,7 129,0-131,0 (126,0-134,0)	1240-1250*	LDA 700 78,5 - 80,5 (75,5 - 83,5)	100 : 165,0-200,0 250 : 11-15** Streuug. max. 3	

Checking values in brackets

* 1 mm less control rod travel than col 2

D. Adjustment Test for Manifold Pressure Compensator

VOL 7,0 e

- 3 -

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing
XXXXXXXXXX

Pump governor	Setting	Measurement	Control rod travel	dimension difference
	Gauge pressure =	bar Gauge pressure =	bar mm	(1)
367 + 394/2R	0,48	0,27	11,5 - 11,6 10,3 - 10,5	
357Z + 394/2R	0,36	0,23	10,6 - 10,7 9,9 - 10,1	
367Y + 394/2R	0,53	0,26	11,8 - 11,9 10,3 - 10,5	

Notes

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 DAF 11,6 k 2

3. Edition

En

PE 6 P 120 A 320 RS 372-1 Y RSV 250-1100 P5/458 R

See Service Information VDT-I-420/114/

Values only apply to test nozzle-and-holder
assembly 1 688 901 019 and fuel-injection test
tubing 1 680 750 067

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

supersedes 7.83

company DAF

engine DKX 1160

243 kW

Komb.-Nr. 0 401 876 261

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8-2,9
(2,75-2,95) mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
850	11,4+0,1	18,3-18,6	0,5 (0,9)			
250	6,4-6,6	1,1-1,5	0,8 (1,2)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
loose	800	0,3-1,0	-	-	-	ca. 24	250	6,0	400	11,6-11,7
	x = 5,0						250	6,4-6,6	300	11,8-12,3
							670-730	= 2,0		
ca. 54	10,4	1140-1150								
2a	4,0	1270-1300								
	1425	0,3-1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limit		3a Fuel delivery characteristics		Starting fuel delivery Idle		4a Idle stop	
Test oil temp 40°C (104°F)		Note changed to							
rev/min	cm ³ /1000 strokes	rev/min		rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3		4	5	6	7	8	9
LDA 850	0,7 bar 183,0-186,0 (180,0-189,0)	1140-1150*		LDA 600	0 bar 135,0-138,0 (132,0-141,0)	100	315,0- 355,0 (311,0- 359,0) = 19,5- 21,0 mm RW	250	6,5

Checking values in brackets

* 1 mm less control rod travel than col 2

2.84

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Testoil ISO 4113

D. Adjustment Test for Manifold Pressure Compensator

DAF 11,6 k 2

- 2 -

Test at n = 600 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting	Measurement		Control rod travel- diminution difference (1)
	Gauge pressure = bar	Gauge pressure = bar	mm	
PE 6 P..RS 372-1y + ..P5/458 R	0,37	0,70 0 0,30	11,0-11,1 11,4-11,5 10,0-10,1 10,3-10,7	

Notes

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

②

Test Specifications Fuel Injection Pumps ② and Governors

40

WPP 001/4 MAN 11.1 q 2

2. Edition

En

Testoil-ISO 4113

PES 6 P 110 A 720 LS 375

RQ 250/1100 PA432DR (1)

supersedes 9.78

.. LS375Z

RQV 250-1100 PA373DR (2)

company M A N

Komb.-Nr. 0 402 046 176 (1)

engine D2566 MTSF/MTSFV

0 402 046 185 (2)

(192kW - 260 PS)

(1 - Nr. 7985)

(2 - Nr. 7024)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

 Port closing at prestroke $\frac{3,00-3,10}{(2,95-3,15)}$ mm (from BDC) Cyl. 6

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	11,7 +0,1	13,6 - 13,8	0,4(0,8)			
250	5,8-7,0	0,9 - 1,5	0,4(0,7)			
700/500	- - -	C, Sp. 4 u. 5	0,6(1,0)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

RQ.. 432DR (1)

Checking of slider PRG check rev/min 1		Full-load speed regulation Setting point rev/min 3				Idle speed regulation Setting point rev/min 7				Torque control rev/min 11	
Control rod travel mm 2		Control rod travel mm 4		Test specifications rev/min 6		Control rod travel mm 8		Test specifications rev/min 10		Control rod travel mm 12	
600	10,2-20,8	600	20,0	10,7	1145-1160	250	7,0	100	min.8,5	1100	11,8
1100	Breakway	VH ca. 49	4,0	1200-1230				250	6,9-7,1	700	11,8
1350	0,1 - 1							370-	410= 2,0		

Torque-control travel on flyweight assembly dimension a = 0 mm

Speed regulation: At

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) rev/min 1		Control rod stop rev/min 3		Fuel delivery characteristics rev/min 4		Starting fuel delivery Idle speed rev/min 6	
cm ³ /1000 strokes 2				cm ³ /1000 strokes 5		cm ³ /1000 strokes/mm 7	
LDA 1100	0,7 bar 136,0 - 138,0 (133,0 - 141,0)			LDA 500	0,18 bar 123,0 - 127,0 (120,0 - 130,0)	100	215,0 - 235,0
700	133,0 - 137,0 (130,0 - 140,0)			LDA 500	0 bar 113,0 - 116,0 (110,0 - 119,0)		

Checking values in brackets

2.84

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B. Governor Settings

RQV.. 373DR (2)

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel:	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
max.	1100	15,2-17,8	-	-	-	ca. 16	100	min. 8,5	250	0,9-1,1
							250	6,9-7,1	500	3,8-4,0
							520-580=	2,0	800	5,4-5,5
ca. 68	10,7 4,0 1400	1140-1150 1245-1275 0 - 1,0				(3a)			1150	8,3

Torque control travel a = 0 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
LDA 1100	0,7 bar 136,0-138,0 (133,5-140,5)	1140-1150 *	LDA 500	0,18 bar 123,0-127,0 (120,0-130,0)	100	215,0-235,0 (211,0-239,0)	1100	11,7+0,1
700	133,0-137,0 (130,0-140,0)		LDA 500	0 bar 113,0-116,0 (110,0-119,0)			700	11,7+0,2

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113**D. Adjustment Test for Manifold Pressure Compensator**Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
XXXXXXXXX

Pump/governor	Setting	Measurement	Control rod travel-diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm
375 mit 432DR 3752 mit 373DR	0,70	0,18 0,12 0	11,7 - 11,8 11,5 - 11,6 11,2 - 11,4 11,0 - 11,1

En

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MAN 11,1v3

2. Edition

En

Testoil-ISO 4113

PES 6 P 110 A 720 LS 375
Komb.-Nr. 0 402 046 220

RQV 250-1100 PA 579

supersedes 6.81

company: MAN

engine: D 2566 MTE
184 kW

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (2,95-3,15) mm (from BDC) RW = 9,0-12,0 mm; Zyl. 6
3,00-3,10

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
800	12,8 + 0,1	16,0 - 16,2	0,4(0,8)			
250	6,9-7,1	1,1 - 1,7	0,4(0,7)			
1100	- - - -	C, Sp. 4-5	0,6(1,0)			
650	- - - -					
500	- - - -					

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1100	15,2-17,8	-	-	-	ca. 11	100 250 350-410 = 2,0	min. 8,5 6,9-7,1	200 500 800 1100	0,7-0,9 3,2-3,5 5,0-5,2 7,9
ca. 47	10,5 4,0 1350	1140-1150 1210-1240 0 - 1,0				3a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) 2		Rotational-speed limitation intermediate speed 4a	Fuel delivery characteristics high idle speed 5b		Starting fuel delivery idle switching point 6		Torque-control travel 5	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9 + 0,1
LDA 800	0,7 bar 160,0-162,0 (157,5-164,5)	1140-1150*	LDA 650	0,7 bar 160,0-164,0 (157,0-167,0)	100	215,0-235,0 (211,0-239,0)	1100 800 900 980	11,5 12,8 12,4 11,3
LDA 1100	0,7 bar 136,0-140,0 (133,0-143,0)		LDA 500	0,17 bar 122,0-126,0	+3			
			LDA 500	0 bar 98,0-100,0	+3			

Checking values in brackets

* 1 mm less control rod travel than col. 2

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D. Adjustment Test for Manifold Pressure Compensator

-2-

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

MAN 11,1 v 3

Testoil-ISO 4113

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel diminution difference mm (1)
375 with 579	0,7		12,8 - 12,9
		0,28	12,1 - 12,2
		0,11	10,7 - 11,0
		0	10,2 - 10,3

Notes

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

①

Test Specifications Fuel Injection Pumps ① and Governors

 WPP 001/4 BET 8,8 b
3. Edition

En

 PE 6 P 120 A 320 RS 377
Komb.-Nr. 0 401 846 400

RQV 250-1200 PA 425 R

 superseded 11.82
company RVI

 Values only apply to test nozzle-and-holder
assembly 1 688 901 019 and fuel-injection test
tubing 1 680 750 067

 engine: MIDS 062030
158 KW

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

 Port closing at prestroke 2,8 - 2,9
(2,75 - 2,95) mm (from BDC) RN = 9,0 - 12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1200	12,6+0,1	15,0-15,2	0,5(0,9)			
275	5,4-5,6	1,1-1,7	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1250	15,2-17,8	-	-	-	ca. 12	200	min. 7,5	250	1,0-1,2
ca. 65	11,6 4,0 1450	1240-1250 1320-1350 0-1,0				280-380 (3a)	275	5,4- 5,6	850 1200	4,6-4,9 8,0

Torque control travel a = - mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational speed ②b limitation intermediate speed rev/min ④a	Fuel delivery characteristics ⑤a high idle speed ⑤b rev/min ④ cm ³ /1000 strokes 5		Starting fuel delivery idle switching point ⑥ rev/min ⑥ cm ³ /1000 strokes 7		Torque-control ⑤ travel rev/min ⑧ Control rod travel mm 9	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	mm 9
LDA 1200	0,7 bar 150,0-152,0 (147,0-155,0)	1240-1250*	LDA 350	0 bar 51,0-55,0 (48,0-58,0)	-	-	-	-
					275	11,0-17,0 (8,0-20,0)		

Checking values in brackets

* 1 mm less control rod travel than col. 2

2.84

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D. Adjustment Test for Manifold Pressure Compensator

BET 8,8 b

-2-

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting	Measurement	Control rod travel- diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
PE6P..RS 377 +RQV..PA 425R	0,70	0 0,20 0,16	12,6-12,7 11,1-11,2 12,2-12,3 11,4-11,6

Notes:

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps 1A and Governors

40

WPP 001/4 PEN 7,0 h
1. Edition

En

PE 6 P 100 A 320 RS 386 RSV 200-900 P1/421
Komb.-Nr. 0 401 876 265

supersedes
company Volvo-Penta
engine D 70 C/HC/RC

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8-2,9
(2,75-2,95) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
900	8,6-8,7	7,1-7,3	0,3(0,6)			
225	7,0-7,2	1,1-1,5	0,2(0,5)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min Degree of deflection of control lever 1			Intermediate rated speed			4 Lower rated speed Control lever deflection in degrees 7			3 Torque control Control rod travel mm 11	
Control rod travel mm 2	Control rod travel mm rev/min 3		4	5	6	rev/min 8	Control rod travel mm 9		rev/min 10	
loose	800	0,3-1,0	-	-	-	ca. 22	225	6,6	-	-
	x =						225	7,0-7,2		
							340-400	=2,0		
ca. 48	7,6	940-950								
2a	4,0	970-1000								
	1100	0,3-1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp 40°C (104°F) rev/min 1		6 Rotational speed limit Note changed to 1 rev/min 3	3a Fuel delivery characteristics rev/min 4		Starting fuel delivery 5 Idle rev/min 6		4a Idle stop Control rod travel mm 9	
cm ³ /1000 strokes 2			cm ³ /1000 strokes 5		cm ³ /1000 strokes 7		rev/min 8	
900	71,0-73,0 (69,0-75,0)	940-950*	-	-	100	200,0-250,0 =20,0- 21,0 mm RW	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

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10.83

C9

C9

②

Test Specifications Fuel Injection Pumps ② and Governors

40

WPP 001/4 MAN 11.1q7

3. Edition

En

Testoil-ISO 4113

PES 6 P120 A 720 LS 388 RQ250/1100 PA 509 (1)
RQV250-1100 PA 504 (2)

Komb.-Nr. 0 402 046 208 (1)
0 402 046 209 (1)
0 402 046 204 (2)
0 402 046 205 (2)

supersedes 7.83

company MAN

engine D 2566 MK

206 kW (280 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (2,95-3,15)
3,00-3,10 mm (from BDC) Cyl. 6

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
750	11,4-11,5	17,7 - 18,1	0,5(0,9)			
250	6,2-6,4	1,2 - 1,8	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

RQ - 509

Checking of slider PRG check ①		Full-load speed regulation ④				Idle speed regulation ⑤				Torque control ③	
rev/min 1	Control rod travel mm 2	Setting point rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	Setting point rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
600	19,2-20,8	600	20,0	9,2	1145-1160	250	6,3	100	min. 7,8	1100	10,2-10,3
1100	Breakway			4,0	1180-1210			250	6,2-6,4	975	10,4-10,6
1400	0- 1,0	VH ca. 49°						350-	390=2,0	875	11,0-11,1
										750	11,4-11,5

Torque-control travel
on flyweight assembly dimension a = 0,45 mm

Speed regulation: At

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever ② Test oil temp. 40°C (104°F)		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery idle speed ⑥	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes/mm 7
LDA 750	0,7 bar 117,0 - 181,0 (174,0 - 184,0)		LDA 650	0,7 bar 174,0 - 177,0	100	215,0-235,0
			LDA 500	0,31 bar 134,0 - 140,0	250	12,0- 18,0
LDA 1100	0,7 bar 166,0 - 172,0 (162,6 - 175,5)		LDA 500	0 bar 102,0 - 106,0	100-	70 (80-190)

Checking values in brackets

(col. 4-5 increase by $\pm 3 \text{ cm}^3$)

3.84

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B. Governor Settings

ROV - 504

MAN 11,1 q7 -2-

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
max.	1100	15,2-17,8				ca. 15	100	min.7,8	250	1,2
							250	6,2-6,4	500	4,0-4,3
ca.66	9,2	1140-1150					395-455= 2,0		1150	8,4
	4,0	1220-1250								
	1400	0 - 1,0								

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery Idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
LDA	0,7 bar		LDA	0,7 bar			1100	10,2-10,3
750	177,0 - 181,0	1140-1150*	650	171,0 - 177,0	100	215,0-235,0	975	10,4-10,6
	(174,0 - 184,0)		LDA	0,31 bar	250	12,0- 18,0	875	11,0-11,1
LDA	0,7 bar		500	134,0 - 140,0			750	11,4-11,5
1100	166,0 - 172,0		LDA	0 bar	100-170 (80-190)			
	(162,5 - 175,5)		500	102,0 - 106,0				

Checking values in brackets (Sp.4-5 (increase by ± 3 cm³))

* 1 mm less control rod travel than co: 2

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure increasing

Pump/governor	Setting	Measurement	Control rod travel- diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm
388 + 509	0,7	0,43 0,31 0	11,4 - 11,5 10,9 - 11,1 10,3 - 10,4 9,2 - 9,3
388 + 504	0,7	0,43 0,31 0	11,4 - 11,5 10,9 - 11,1 10,3 - 10,4 9,2 - 9,3

En

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 DAF 11,6 v 1

1. Edition

En

PE6P 110 A 320 RS 407-1
Komb.-Nr. 0 401 876 276

RSV 275-1100 P 5/458-4

supersedes

company DAF

engine DKTL 1160

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $\begin{matrix} 2,8 - 2,9 \\ (2,75 - 2,95) \end{matrix}$ mm (from BD \hat{c}) RW = 9,0 - 12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
850	12,3+0,1	13,9-14,2	0,4 (0,75)			
275	7,0-7,2	1,0- 1,5	0,45(0,75)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
loose	800	0,3 - 1,0 x = 3,25	-	-	-	ca. 18	275	6,6	400	12,5-12,6
							275	7,0-7,2	300	12,7-13,2
ca. 47	11,3	1135-1145					675 - 745	=2,0		
2a	4,0	1275-1305								
	1350	0,3- 1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limit		3a Fuel delivery characteristics		Starting fuel delivery 5		4a Idle stop	
Test oil temp. 40°C (104°F)		Note changed to 1 rev/min				Idle			
rev/min 1	cm ³ /1000 strokes 2	3	4	cm ³ /1000 strokes 5	6	rev/min 7	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
LDA	0,7 bar	1135-1145*	LDA	0 bar	100	245,0-285,0	(241,0-289,0)	0 275	7,1
850	139,0-142,0 (136,5-144,5)		600	135,5-138,5 (133,0-141,0)					

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.84

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C12

c12

Testoil 90 4113

D. Adjustment Test for Manifold Pressure Compensator

DAF 11,6 v 1 -2-

Test at n = 600 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting	Measurement	Control rod travel- diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
PE6P..RS 407-1 +RSV..P5/458-4	0,70	0 0,30	12,3 - 12,4 12,1 - 12,2 12,2 - 12,3

Notes:

() when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 RVI 14,9 c
1. Edition

PES 8 P 120 A320 RS 466 RQV 275-1050 PA 665
1-8-4-2-7-3-6-5 je 45° ± 0,5° (± 75°)

Values only apply to test nozzle-and-holder
assembly 1 688 901 019 and fuel-injection test
tubing 1 680 750 067

supersedes

company RVI

engine MIVS 083530

268 KW

Komb.-Nr.0 402 048 042

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing mark 13° after
port closing cyl. 1

Port closing at prestroke		mm (from BDC) port closing cyl. 1				
Rotational speed	Control rod travel	Fuel delivery	Difference	Control rod travel	Fuel delivery	Spring pre-tensioning (torque-control valve)
rev/min	mm	cm ³ /100 strokes	cm ³ /100 strokes	mm	cm ³ /100 strokes	mm
1	2	3	4	2	3	6
1050	9,6-9,7	19,2-19,4	0,5(0,9)			
275	2,6-2,8	1,7- 2,3	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
max.	1150	15,2-17,8	-	-	-	ca.7	200	min. 4,2	275	1,5-1,6
ca.63	8,6 4,0 1300	1105-1115 1175-1205 0-1,0					275 275-325=	2,6- 2,8 2,0	400 525 650 1050	3,1-3,4 4,0-4,5 5,0-5,2 7,7

Torque control travel a = - mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery		Rotational-speed limitation		Fuel delivery characteristics		Starting fuel delivery		Torque-control	
Control-rod stop	Test oil temp. 40°C (104°F)	intermediate speed	high idle speed	idle speed	switching point	idle speed	switching point	travel	Control rod travel
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	rev/min	mm
1	2	3	4	5	6	7	8	8	9
LDA 1050	0,9 bar 192,0-194,0 (189,0-197,0)	1105-1115*	LDA 500	0 bar 119,0-121,0 (116,0-124,0)	100	140,0-160,0 (136,0-164,0)		-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

2,84

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D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

RVI 14,9c

-2-

Pump/governor	Setting	Measurement	Control rod travel- diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
PES8P..RS 466 +RQV...PA 665	0,90	0 0,30 0,26	9,6 - 9,7 7,7 - 7,8 9,0 - 9,1 8,1 - 8,3

Notes.

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 MB 9,6 k 1

1. Edition

En

PE 6 P 100 A 320 LS 805 EP/RSV 575-1250 PO/814

supersedes

company Daimler-Benz

engine OM 401

129 kW (175 PS)

1- 6- 3 - 5 - 2 - 4
0-75-120-195-240-315° $\pm 0,5^\circ$ ($\pm 0,75^\circ$)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $3,4-3,5$
(3,35-3,55) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12,0	11,7-12,4	0,4			
600	9,0	5,0-6,2				
	15,0	15,3-17,0				
200	9,0	3,5-4,5				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
ca. 63	1250	16,0	without auxiliary spring			ca. 30	575	4,7	-	-
	1280	12,1					200	19-21		
	1310	5,2	with auxiliary spring				575	4,3-5,0		
ca. 62	1250	ca. 9,7					620	0-1,0		
	1300	ca. 4,1								
(2a)	1370	0,3-1,0								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational speed limit		3a Fuel delivery characteristics		Starting fuel delivery 5		4a Idle stop	
Test oil temp 40°C (104°F)		Note changed to 1 rev/min				Idle			
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9	
1230	93,0-95,0 (91,0-97,0)	1265-1275*	-	-		High idle speed 1290-1305 4,1 mm RW Streuung max. 6			

Checking values in brackets

* 1 mm less control rod travel than col. 2

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Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 MB 9,6 b

6. Edition

En

PE 6 P 100 A 320 LS 818 RSV 350-1250 P0/810
Komb.-Nr. 0 401 876 183

1- 6- 3 - 5 - 2 - 4
0-75-120-195-240-315° $\pm 0,5^\circ$ ($\pm 0,75^\circ$)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

superseded 1.79
company Daimler-Benz
OM 401
engine 141 kW (192 PS) (1)
129 kW (175 PS) (2)

A. Fuel Injection Pump Settings

Port closing at prestroke 3,4-3,5
(3,35-3,55) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1230	10,3+0,1	10,2-10,4	0,3(0,6)			
350	7,2-7,4	1,4-2,0	0,3(0,5)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min Degree of deflection of control lever 1			Intermediate rated speed 4 5 6			4 Lower rated speed Control-lever deflection in degrees rev/min 7 8 9			3 Torque control rev/min Control rod travel 10 11	
	Control rod travel mm 2	Control rod travel mm rev/min 3								
loose	800	0,3-1,0	-	-	-	ca. 34	350	7,3	-	-
ca. 62	9,3	1280-1290					350	7,2-7,4		
2a	4,4	1360-1380					580-640	= 2,0 **		
	1400	0,3-1,7								

The numbers denote the sequence of the tests ** Set auxiliary idle spring at 2,0 mm control-rod travel.

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp 40°C (104°F) rev/min 1		6 Rotational-speed limit Note changed to rev/min 3		3a Fuel delivery characteristics rev/min cm ³ /1000 strokes 4 5		Starting fuel delivery Idle rev/min cm ³ /1000 strokes 6 7		5 Idle stop rev/min Control rod travel mm 8 9	
1230 (1)	102,0-104,0 (100,0-106,0)	1280-1290*	-	-	-	100	140,0-160,0	-	-

Checking values in brackets

* 1 mm less control rod travel than col 2

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12.83

C17

C17

B. Governor Settings

① Upper rated speed			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca. 63	1250	14,0	without auxiliary spring			ca. 31	350	5,9	-	-
	1350	8,7								
	1450	2,8					100	19-21		
ca. 60	1250	ca. 10,8	with auxiliary spring				350	5,6-6,2		
	1360	ca. 4,4					450	0,9-3,1		
	1430	0,3-1,0					500	0-1,0		

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

② Full-load stop		⑥ Rotational-speed limit		③a Fuel delivery characteristics		Starting fuel delivery idle		⑤a Idle stop	
Test oil temp 40°C (104°F)		Note: changed to rev/min							
rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	
1230 (2)	93,0-95,0 (91,0-97,0)	1280-1290*	-	-	100	110,0-130,0	-	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

B. Governor Settings

① Upper rated speed			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
⑤										

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

② Full-load stop		⑥ Rotational-speed limit		③a Fuel delivery characteristics		Starting fuel delivery idle		⑤a Idle stop	
Test oil temp 40°C (104°F)		Note: changed to rev/min							
rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	

Checking values in brackets

* 1 mm less control rod travel than col. 2

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 MB 9,6 b 2

1. Edition

En

PE 6 P 100 A 320 LS 818 RSV 350-1100 P0/813

1- 6- 3 - 5 - 2 - 4
0-75-120-195-240-315° $\pm 0,5^\circ$ ($\pm 0,75^\circ$)

supersedes
company Daimler-Benz
OM 401
engine 121 kW (165 PS) (1)
110 kW (150 PS) (2)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,4-3,5
(3,35-3,55) mm (from BDC) Zyl. 6

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12,0	11,7-12,4	0,4			
600	9,0 15,0	5,0-6,2 15,3-17,0				
200	9,0	3,5-4,5				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min Degree of deflection of control lever 1			Intermediate rated speed			4 Lower rated speed Control lever deflection in degrees 7			3 Torque control Control rod travel mm 11	
Control rod travel mm 2	Control rod travel mm rev/min 3		4	5	6	rev/min 8	Control rod travel mm 9		rev/min 10	
ca. 56	1100 14,0 1200 8,9 1270 4,2		without auxiliary spring			ca. 32	350 5,9		1080 0	
ca. 53	1100 ca. 9,7 1195 ca. 3,9 1300 0,3-1,0						200 19-21 350 5,6-6,2 420 2,4-4,1 530 0-1,0		500 0,1-0,3	

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp. 40°C (104°F) rev/min 1		6 Rotational speed limit Note changed to rev/min 3		3a Fuel delivery characteristics rev/min 4		Starting fuel delivery Idle rev/min 6		5 Idle stop Control rod travel mm 9	
cm ³ /1000 strokes 2				cm ³ /1000 strokes 5		cm ³ /1000 strokes 7			
(1) 1080	87,0-89,0 (85,0-91,0)	1115-1130*				100	110,0-130,0		
(2) 1080	77,0-79,0 (75,0-81,0)	1115-1130*				High idle speed 1180-1200 3,9 mm RW Streuung max. 6			

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

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Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 SCA 11.0 m
3. Edition

En

PE 6 P 110 A 720 RS 3006 RQV 250-1100 PA 134 R (1)
.. PA 242 R (2)

superseded by .82
company Scania
engine DS 11

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (3.25-3.45) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12.0+0.1	13.3-14.1	0.6			2.5 ± 0.1 ** (max. 2.2-2.9)
600	9.0-9.1	6.8-8.0				
	12.0+0.1	13.1-14.6				
200	15.0+0.1	19.9-21.6				
	9.0-9.1	4.4-5.4				

Adjust the fuel delivery from each outlet according to the values in .

** In case valve-spring spread is higher, change the initial tension accordingly.

B. Governor Settings

RQV..PA 184 R (1)

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 66	1150 1440	16.0-19.0 0	-	-	-	ca. 10	100 250 400 550 680	6.3-7.9 4.8-6.4 2.5-3.8 1.0-2.4 0	1170	3.3
ca. 62	1100 1200 1300 1400	15.0-17.4 8.4-12.3 1.0-6.4 0				③a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics high idle speed ⑤b		Starting fuel delivery idle switching point ⑥	Torque-control travel ⑤		
rev/min	cm³/1000 strokes	rev/min ④a	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
LDA 1100 (1)	0.7 bar 173.5-175.0 (171.0-177.0)	1135-1145*	LDA 600	0.7 bar 173.0-177.0 (171.0-179.0)	100	190.0-240.0	-	-
			LDA 500	0 bar 135.0-141.0 (133.0-143.0)	225	10.0-12.0 Streuung max. 2.0		
					1200	29.0-34.0 Streuung max. 4.0		

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.84

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B. Governor Settings

RQV.. PA 242R

SCA 11,0 m

-2-

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
max.	1100	15,2-17,8	-	-	-	ca.10	100	min. 7,8	200	0,6-0,8
ca.64	12,2 4,0 1400	1140-1150 1260-1290 0-1,0				(3a)	250 370	6,3-6,5 - 430=2,0	500 800 1100	3,9-4,4 5,7-5,9 8,3

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
LDA 1100 (2)	0,7 bar 161,0-163,0 (159,0-165,0)	1140-1150*	LDA 600 LDA 500	0,7 bar 164,5-169,5 (162,0-172,0) 0 bar 133,0-137,0 (131,0-139,0)	100	190,0-240,0 =20,0- 21,0 mm RW	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil ISO 4113

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting	Measurement	Control rod travel
	Gauge pressure = bar	Gauge pressure = bar	diminution difference mm
PE6P..RS 3006 +RQV..PA 184R	0,43-0,46	0,20-0,24	0,1 1,3
PE6P..RS 3006 +ROV..PA 242R	0,70	0 0,34 0,26	13,2-13,3 12,1-12,2 12,8-12,9 12,3-12,5

En

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 SCA 8,0 k

6. Edition

En

PE 6 P 110 A 720 RS 3034 RSV 350-1200 P 1/462 R
Komb.-Nr. 0 401 876 715

supersedes 6.83
Scania
company DS 8 05
engine

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (3,25-3,45) mm from BDC $\Delta RW = 9,0 - 12,0$ mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	12,8+0,1	12,1-12,3	0,5(0,7)			2,5 \pm 0,1 (2,2 - 2,9)
350	5,9-6,1	-	0,2(0,4)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0	-	-	-	ca. 29	350	5,5	-	-
		x = 4,0					350	5,9-6,1		
ca. 71	11,8	1240-1250					500-550	2,0		
2a	4,0	1310-1340								
	1450	0,3-1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limit		3a Fuel delivery characteristics		Starting fuel delivery Idle		4a Idle stop	
Test oil temp 40°C (104°F)		Note changed to)							
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9	
700	121,0-123,0 (119,0-125,0)	1240-1250*	1200	126,5-131,5 (124,0-134,0)	100	190,0-240,0 =20,0- 21,0 mm RW	350	5,5	

Checking values in brackets

* 1 mm less control rod travel than col. 2

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Test Specifications

Fuel Injection Pumps ①

and Governors

WPP 001/4 SCA 8,0 d

5. Edition

En

PE 6 P 110 A 720 RS 3034 RQV 200-1200 PA 275 R

 superseded by 8.83
 company: Scania
 engine DS 804

Komb.-Nr. 0 401 846 709

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke

3,3-3,4

(3,25-3,45)

mm (from BDQ) RW = 9,0 - 12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
600	12,3+0,1	11,7-11,9	0,5 (0,7)			2,5 [±] 0,1
225	4,4-4,6	0,9-1,3	0,2 (0,4)			(2,2-2,9)

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1200	15,2-17,8	-	-	-	ca. 9	100 225 330-390 = 2,0	min. 5,9 4,4-4,6 = 2,0	150 500 850 1200	0,6-0,8 3,8-4,4 5,9-6,1 8,4
ca. 62	11,3 4,0 1500	1240-1250 1370-1400 0 - 1,0				3a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) 2		Rotational speed limitation intermediate speed 4a	Fuel delivery characteristics high idle speed 5b		Starting fuel delivery idle switching point 6		Torque-control travel 5	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
LDA 600	0,9 bar 117,0-119,0 (114,5-121,5)	1240-1250 *	LDA 1200	0,9 bar 119,5-122,5 (116,5-125,5)	100	190,0-240,0 = 20,0-21,0 mm RW	-	-
			LDA 500	0 bar 81,0-85,0 (79,0-87,0)				

Checking values in brackets

* 1 mm less control rod travel than col. 2

D. Adjustment Test for Manifold Pressure Compensator

SCA 8,0 d -2-

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting	Measurement	Control rod travel	diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm	(1)
PE6P..RS3034 + RQV.. PA 275 R	0,90			12,3-12,4
		0		10,6-10,7
		0,40		11,9-12,0
		0,25		10,8-11,0

Notes

(1) when n =

rev/min and
gauge pressure =

bar : maximum full-load control rod travel

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 SCA 8,0 i

5. Edition

En

PE 6 P 110 A 720 RS 3034

RQV 200-1200 PA 554

superseded 6, 83

Komb.-Nr. 0 401 846 733

company Scania

engine DS 805

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $3,3-3,4$
(3,25-3,45) mm (from BDC) = RW 9,0-12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	12,8+0,1	12,1-12,3	0,5(0,7)			2,5 ⁺ 0,1
225	5,9-6,1	1,5-1,9	0,2(0,4)			(2,2-2,9)

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1200	15,2-17,8	-	-	-	ca.16	100 225	min.7,4 5,9-6,1	150 500 850 1200	0,5-0,8 3,8-4,5 5,9-6,1 8,4
ca. 64	11,8 4,0 1500	1240-1250 1385-1415 0-1,0					410-470 = 2,0			

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) 2		Rotational-speed limitation intermediate speed 4a	Fuel delivery characteristics high idle speed 5b		Starting fuel delivery Idle switching point 6		Torque-control travel Control rod travel mm 5	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	mm 9
LDA 700	0,9 bar 121,0-123,0 (119,0-125,0)	1240-1250*	LDA 1200 LDA 500	0,9 bar 126,5-131,5 (124,0-134,0) 0 bar 85,0-89,0 (83,0-91,0)	100	190,0-240,0 =20,0-21,0 mm RW	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

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D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

SCA 8,0 i -2-

Pump/governor	Setting	Measurement		Control rod travel	diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm	(1)	
PE 6 P..RS 3034 +RQV.. PA 554	0,90	0 0,33 0,22		12,8-12,9 11,6-11,7 12,5-12,6 11,7-11,9	

Notes

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

①

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 SCA 8,0 i 1

3. Edition

En

PE 6 P 110 A 720 RS 3034 Z RQV 200-1200 PA 554

Komb.-Nr. 0 401 846 770

supersedes 6.83

company Saab Scania

engine DS8 05

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke $\frac{3,3 - 3,4}{(3,25 - 3,45)}$ mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	11,8+0,1	10,1 - 10,3	0,5(0,7)			25 ± 0,1
225	5,9-6,1	1,5 - 1,9	0,2(0,4)			(2,2 - 2,9)

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel ①	
Degree of deflection of control lever 1	rev/min 2	Control rod travel mm 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1220	15,2-17,8	-	-	-	ca. 16	100	min. 7,4	150	0 - 1,0
ca. 61	10,8 4,0 1500	1240-1250 1360-1390 0 - 1,0					225 410-470 = 2,0	5,9- 6,1	500 850 200	3,4-3,9 5,4-5,8 7,9

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics ⑤a		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
LDA 700	0,9 bar 101,0-103,0 (99,0-105,0)	1240-1250*	LDA 1200	0,9 bar 110,5-115,5 (108,0-118,0)	100	190,0-240,0 = 20,0-21,0 mm RW	-	-
			LDA 500	0 bar 85,0-89,0 (83,0-91,0)				

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.84

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D. Adjustment Test for Manifold Pressure Compensator

SCA 8,0 i 1

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure increasing

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution difference mm (1)
PE 6 P..RS 3034 Z + RQV..PA 554	0,90	0 0,21	11,8 - 11,9 11,6 - 11,7 11,7 - 11,8

Notes
(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps 1A and Governors

WPP 001/4 SCA 11,0 r 4
5. Edition

40

En

PE 6 P 110 A 720 RS 3040 RSV 350-1100 P1/481
Komb.-Nr. 0 401 876 720

supersedes 6.83
company Scania
DS 11 05
engine Case

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke ^{3,3-3,4}(3,25-3,45) mm (from BDC) = RW 9,0-12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	13,1+0,1	15,6-15,8	0,6(0,8)			
350	4,4-4,6	1,8-2,2	0,2(0,4)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0	-	-	-	ca. 23	350	4,0	-	-
	x =	2,75					100	min. 20,0		
							350	4,4-4,6		
ca. 66	12,1	1140-1150					460-520	= 2,0		
2a	4,0	1220-1250								
	1350	0,3-1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational speed limit		3a Fuel delivery characteristics		Starting fuel delivery 5		4a Idle stop	
Test oil temp 40°C (104°F)		Note changed to 1 rev/min							
rev/min 1	cm ³ /1000 strokes 2	3	4	5	6	7	8	9	Control rod travel mm 9
1100	156,0-158,0 (154,0-160,0)	1140-1150*	700	157,5-160,5 (155,0-163,0)	100	240,0-290,0 = RW 20,0-21,0 mm	-	-	-
					350	18,0-22,0			

Checking values in brackets

* 1 mm less control rod travel than col 2

D5

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3.84

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 DEE 15,6 a

1. Edition

En

PES 8 P 110 A 120 RS 3044 EP/RSV 400-1050 P2/435 DR

supersedes -

Komb.-Nr. 0 402 068 700

company John Deere

1-5-6-3-4-2-7-8 je $45^\circ \pm 0,5 (\pm 0,75^\circ)$

engine 8955 T

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $2,75-2,85$ mm (from BDC)
 $(2,70-2,90)$

Testoil-ISO 4113

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque control valve) mm 6
1050	10,0+0,1	14,7-14,9	0,4(0,75)			
400	5,2-5,4	2,2- 2,8	0,4(0,75)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min Degree of deflection of control lever 1			Intermediate rated speed 4 5 6			4 Lower rated speed Control lever deflection in degrees 7 rev/min 8			3 Torque control Control rod travel mm 10 11	
Control rod travel mm 2	Control rod travel mm rev/min 3					Control rod travel mm 9				
loose	800	0,3-1,0	-	-	-	ca. 21	400	4,6-4,8	1050	10,0-10,1
ca. 43,5	9,0	1095-1105					100	min. 16,0	750	10,9-11,2
2a	4,0	1155-1185					400	5,1-5,3	550	9,5- 9,6
	1275	0,3- 1,7					565-625	= 2,0		
							800	max. 1,0		

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp. 40°C (104°F) rev/min 1		6 Rotational speed limit Note changed to) rev/min 3		3a Fuel delivery characteristics rev/min 4		Starting fuel delivery Idle rev/min 6		5 Idle stop Control rod travel mm 8 9	
cm ³ /1000 strokes 2				cm ³ /1000 strokes 5		cm ³ /1000 strokes 7			
LDA 1050	0,65 bar 147,0-149,0 (144,0-152,0)	1095-1105*	LDA 750	0,65 bar 163,5-166,5 (160,0-170,0)		100	180,0-200,0 =19-21mmRW	-	-
			LDA 550	0 bar 130,0-134,0 (127,0-137,0)		High idle speed 1155	37,0-47,0		
						Low idle speed 400	22,0-28,0		

Checking values in brackets

* 1 mm less control rod travel than col 2

- 2 -

D. Adjustment Test for Manifold Pressure Compensator

DEE 15,6 a

Test at n = 550 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting	Measurement	Control rod travel - diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
PES 8P..RS 3044 + EP/RSV..P2/435DR	0,38	0,27	10,7-10,8 9,7-10,1

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

①

Test Specifications Fuel Injection Pumps ① and Governors

KPP 001/4 VOL 12,0 d 2

3. Edition

En

PE 6 P 120 A 320 RS 3050 RQV 250-1025 PA 611
Komb.-Nr. 0 401 846 751

supersedes 7.83
company Volvo
engine TD 120 FC

Values only apply to test nozzle-and-holder
assembly 1 688 901 019 and fuel-injection test
tubing 1 680 750 067

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke $2,4 - 2,5$
($2,35 - 2,55$) mm (from BDC) bei RW 9,0 - 12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	13,0+0,1	23,8 - 24,0	0,5(0,9)			2,5 ± 0,1 (2,2 - 2,9)
250	3,6 - 3,8	2,2 - 2,6	0,5(0,7)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1080	15,2-17,8	-	-	-	ca. 8	100 250 300-360 = 2,0	min. 5,1 3,6 - 3,8	200 475 670- 940 1025	0,6-0,9 3,9-4,5 6,4-6,6 7,5
ca. 64	12,0 4,0 1300	1085-1095 1150-1180 0 - 1,0				③a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics high idle speed ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
LDA 700	1,2 bar 237,5-239,5 (234,5-242,5)	1085-1095*	LDA 700	0 bar 142,0-144,0 (139,0-147,0)	100	20,0-21,0 mm RW	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.84

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28

D8

D. Adjustment Test for Manifold Pressure Compensator

-2-

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure increasing

VOL 12,0 d 2

Pump/governor	Setting	Measurement		Control rod travel - diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm	(1)
PE6P..RS3050 with..PA611	0,67	1,20		13,0 - 13,1
		0		9,1 - 9,2
				12,2 - 12,3
		0,3		10,5 - 10,7

Notes

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Testoil-ISO 4113

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 KHD 15,3

4. Edition

En

Testoil-ISO 4113

PE 10 P 110 A 920/5 LS 3073 RQV 300-1150 PA 549
Komb.-Nr. 0 401 849 703
1-10-9 - 4- 3 - 6 - 5 - 8 - 7 - 2
0-27-72-99-144-171-216-243-288-315 ° ±0,5 ° (±0,75 °)

supersedes 83
company KHD
engine BF 10L 413 F
265 kW (360 PS)
bei 2050 min⁻¹
bzw. 259 kW (352 PS)
(Maxidyne)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke ^{2,8-2,9}
(2,75-2,95) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
800	11,6±0,1	13,8-14,0	0,4(0,8)			
300	6,9-7,1	1,8 - 2,4	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1220	15,2-17,8	-	-	-	ca. 24	100	min. 8,4	250	0,5-0,8
							300	6,9-7,1	550	3,6-4,2
							465-525	= 2,0	850	5,4-5,7
ca. 64	9,7 4,0 1400	1190-1200 1270-1300 0 - 1,0				3a			1150	7,8

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ④a	Fuel delivery characteristics high idle speed ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
LDA 800	0,9 bar 138,0-140,0 (135,0-143,0)	1190-1200 *			100	110,0-140,0	1150 1025 875 800	10,7±0,2 10,9±0,2 11,4±0,2 11,6±0,1
			LDA 500	0 bar 85,0-89,0 (82,0-92,0)				

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.84

D10

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D. Adjustment Test for Manifold Pressure Compensator

KHD 15,8 f

- 2 -

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution difference mm (1)
PE 10 P..LS 3073 RQV.. PA 549	0,55	0,90 0 0,39	11,2-11,3 11,6-11,7 9,4-9,5 10,1-10,3

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

①

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 RVI 12,0 e

1. Edition

En -

PES 6 P 120 A 320 RS 3117
Komb.-Nr. 0 402 046 740

RQV 275-950 PA 495-1

supersedes:

company: RVI

engine: MIDR 063540
224 kW

Values only apply to test nozzle-and-holder
assembly 1 688 901 019 and fuel-injection test
tubing 1 680 750 067

Port closing mark 9° after

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers. port closing cyl. 1

A. Fuel Injection Pump Settings

Port closing at prestroke $\frac{3,5-3,6}{(3,45-3,65)}$ mm (from BDC) RW = 9,0-12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
950	13,1+0,1	20,4-20,6	0,5(0,9)			
275	4,5-4,7	1,3-2,1	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1140	15,2-17,8	-	-	-	ca. 10	200	min. 6,2	250	1,0-1,2
ca. 63	12,1	1015-1025					275	4,5-4,7	450	3,4-3,8
	4,0	1150-1180							800	5,8-6,0
	1300	0 - 1,0				285-395			1100	8,1
						③a				

Torque control travel a = " mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational speed limitation intermediate speed ④a	Fuel delivery characteristics high idle speed ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
LDA 950	0,7 bar 204,0-206,0 (201,0-209,0)	1015-1025*	LDA 500	0 bar 123,0-125,0 (120,0-128,0)	100	160,0-180,0 (156,0-184,0)	-	-
					275	14,0-20,0 (11,0-23,0)		

Checking values in brackets

* 1 mm less control rod travel than col. 2

D12

2.84

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D12

D. Adjustment Test for Manifold Pressure Compensator

RVI 12,0 e - 2 -

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting	Measurement		Control rod travel - diminution difference (1)
	Gauge pressure = bar	Gauge pressure = bar	mm	
PES6P..RS 3117 + RQV.. PA 495-1	0,70	0 0,42 0,34		13,1-13,2 10,3-10,4 12,5-12,6 10,9-11,3

Notes

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

①

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 RVI 12,0 e 1

1. Edition

En

PES 6 P 120 A 320 RS 3117
Komb.-Nr. 0 402 046 741

RQV 275-1100 PA 495-2

supersedes

company RVI

engine MIDR 063540
224 kW

Values only apply to test nozzle-and-holder
assembly 1 688 901 019 and fuel-injection test
tubing 1 680 750 067

Port closing mark 9° after
port closing cyl. 1

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $3,5-3,6$ mm (from BDC) RW = 9,0-12,0 mm
(3,45-3,65)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1100	13,1+0,1	20,4-20,6	0,5(0,9)			
275	4,5-4,7	1,4-2,0	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
max.	1140	15,2-17,8	—	—	—	ca. 10	200	min. 6,2	250	1,0-1,2
ca. 66	12,1	1165-1175					275	4,5-4,7	450	3,4-3,8
	4,0	1270-1300							800	5,8-6,0
	1400	0 - 1,0				285-395			1100	8,1
						③a				

Torque control travel a = — mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational speed intermediate speed	Fuel delivery characteristics high idle speed	Starting fuel delivery idle switching point	Torque-control travel
rev/min	cm ³ /1000 strokes	rev/min	rev/min	rev/min	rev/min
1	2	3	4	6	8
LDA 1100	0,7 bar 204,0-206,0 (201,0-209,0)	1165-1175*	LDA 500 0 bar 123,0-125,0 (120,0-128,0)	100 160,0-180,0 (156,0-184,0) 275 14,0-20,0 (11,0-23,0)	—
					Control rod travel mm
					9

Checking values in brackets

* 1 mm less control rod travel than col. 2

2.84

Testoil-ISO 4113

D. Adjustment Test for Manifold Pressure Compensator

RVI 12,0 e 1 - 2 -

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting	Measurement	Control rod travel - diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
PES 6 P..RS3117 +RQV..PA 495-2	0,70	0 0,42 0,34	13,1-13,2 10,3-10,4 12,5-12,6 10,9-11,3

Notes

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

①

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 VOL 12,0 K 2

1. Edition

Ea

PE 6 P 120 A 320 RS 3118 RQV 300-1050 PA 657-2
Komb.-Nr. 0 401 846 779

Values only apply to test nozzle-and-holder
assembly 1 688 901 019 and fuel-injection test
tubing 1 680 750 067

supersedes

company Volvo BM

engine TD 121 F

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke		2,6-2,7 (2,55-2,75)	mm (from BDC)		RW = 9,0-12,0 mm	
Rotational speed	Control rod travel	Fuel delivery	Difference	Control rod travel	Fuel delivery	Spring pre-tensioning (torque-control valve)
rev/min	mm	cm ³ /100 strokes	cm ³ /100 strokes	mm	cm ³ /100 strokes	mm
1	2	3	4	2	3	6
700	13,2+0,1	23,5-23,7	0,5 (0,9)			2,5 [±] 0,1 (2,2-2,9)
300	3,7-3,9	2,2-2,6	0,5 (0,7)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
max.	1130	15,2-17,8	-	-	-	ca. 10	100	min. 5,2	250	1,1-1,3
ca. 64	12,2	1105-1115					300	3,7-3,9	450	3,7-4,2
	4,0	1180-1210					350-410	= 2,0	660	6,4-6,6
	1325	0 - 1,0							-	
									985	7,4
									1050	

Torque control travel a = - mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery		Rotational-speed		Fuel delivery characteristics		Starting fuel delivery		Torque-control	
Control-rod stop		limitation		high idle speed		idle		travel	
Test oil temp. 40°C (104°F)		intermediate speed				switching point			
rev/min	cm ³ /1000 strokes	rev/min	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel
1	2	3	4a	4	5	6	7	8	9
LDA	1,2 bar	1105-1115 *		LDA	1,2 bar	100	24,0-270,0	-	-
700	235,0-237,0			1000	231,0-237,0		= 20,0-21,0		
	(232,0-240,0)				(228,0-240,0)		mm RW		
				LDA	0 bar				
				700	136,0-138,0				
					(133,0-141,0)				

Checking values in brackets

* 1 mm less control rod travel than col. 2

12.83

Testoil-ISO 4113

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D. Adjustment Test for Manifold Pressure Compensator

VOL 12,0 K 2 - 2 -

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel diminution difference mm (1)
PE6P..RS 3118 + RQV..PA 657-2	1,20	0 0,64 0,25	13,2-13,3 8,9-9,0 12,2-12,3 10,0-10,2

Notes:
(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

①

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MB 18,3 d

3. Edition

En

Testoil-ISO 4113

PE 10 P 110 A 320 LS 3818 RQV 300-1150 PA 486-2

superse 83

company Daimler-Benz

OM 423

engine 261 kW (355 PS)

Komb.-Nr. 0 401 849 706

 1 - 8 - 7 - 6 - 3 - 5 - 2 - 10 - 9 - 4
 0 -27 -72 -99 -144-171-216-243-288-315° ± 0,5° (± 0,75°)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

 Port closing at prestroke $4,0 - 4,1$ mm (from BDC) Zyl. 10
 (3,95-4,15)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1150	12,1+0,1	12,4 - 12,6	0,4(0,8)			
300	8,5-8,7	1,4 - 2,2	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
max.	1200	15,2-17,8	-	-	-	ca. 19	100	min.10,2	250	1,0-1,2
ca. 65	11,1	1190-1200				330-470	300	8,5-8,7	550	3,4-3,7
	4,0	1240-1270							850	4,9-5,3
	1400	0 - 1,0							1150	7,6

Torque control travel a = 0,5 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery Idle switching point		Torque-control	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
1150	124,0-126,0 (121,5-128,5)	1190-1200 *	600	110,0-114,0 (107,0-117,0)	100	10,0-10,0	1150	12,1+0,1
			900	118,0-123,0 (115,0-126,0)			600	12,5+0,1
							900	12,4+0,2

Checking values in brackets

* 1 mm less control rod travel than col. 2

2.84

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D18

②

Test Specifications Fuel Injection Pumps ② and Governors

40

 WPP 001/4 MB 21,9 a 3
1. Edition

Ea

PE 12 P 120 A 320 LS 3819-1 RQ 750 PA 635-1

1- 5- 9- 8- 3 - 4 - 11- 10- 2 - 6 - 7 - 12

0-15-60-75-120-135-180-195-240-255-300-315°+ 0,5° (+ 0,75°)

Values only apply to test nozzle-and-holder

assembly 1 688 901 019 and fuel-injection test

tubing 1 680 750 067

supersedes -

company: Daimler-Benz

engine: OM 424 LA

327 kW

Komb.-Nr. 0 401 840 714

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (3,95 - 4,15) mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
700	11,8+0,1	19,0 - 19,2	0,5 (0,8)			
300	4,8-5,0	1,4 - 2,0	0,8 (1,2)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
①		Setting point		Test specifications		Setting point		Test specifications		③	
rev/min	Control rod travel mm	rev/min	Control rod travel mm	Control rod travel mm	rev/min	rev/min	Control rod travel mm	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11	12
-	-	-	-	10,8 4,0 900	750-755 780-790 0-1,0	-	-	-	-	-	-

Torque-control travel
on flyweight assembly dimension a =

mm

Speed regulation: At 750 - 755 min⁻¹1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop		Fuel delivery characteristics		Starting fuel delivery idle speed	
②		③a		③b		⑥	
rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8
700	190,0 - 192,0 (187,0 - 195,0)	-	-	-	-	100	160,0 - 180,0 (156,0 - 184,0)

Checking values in brackets

2,84

Test oil: ISO 4113

D19

D19

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Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 GUS 18,0 a
1. Edition

En

PE 6 P 130 A 720 RS 7009 RQV 250-1000 PA 683
Komb.-Nr. 0 402 646 816
Values only apply to test nozzle-and-holder
assembly 1 688 901 019 and fuel-injection test
tubing 1 680 750 067

supersedes
company: Guascor
engine F 180
220 kW

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $3,0 - 3,1$ mm (from BDC) RW = $9,0 - 12,0$ mm
(2,95-3,15)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1 000	14,5±0,1	31,6 - 32,0	0,6(1,05)			
250	6,4-6,6	2,6 - 3,2	0,95(1,3)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
max.	1060	15,2-17,8	-	-	-	ca. 13	100	min.8,0	225	1,2-1,3
ca. 62	13,5 4,0 1300	1040-1050 1155-1185 0-1,0				250-350	250	6,4-6,6	375 800 1000	2,7-3,2 5,6-5,8 7,7

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
1000	316,0-320,0 (311,5-324,5)	1040-1050*	-	-	-	-	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

Test specifications

Fuel injection pumps and governors

WPP 001/4 MTU 29,9 a 1
1. Edition

En.

PE 8 ZWM 140/120 RS 19/11
Komb.-Nr. 0 406 038 005

RQU 375/1100 ZWA 19 DR

Replaces

Firm: MTU
Engine: MB 837 A a

1 - 2 - 6 - 3 - 4 - 5 - 7 - 8 je $45^\circ \pm 0,5^\circ (\pm 0,75^\circ)$

Note VDT-W-Gen./7

Governor adjustment according to VDT-I-420/112

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

Port closing at prestroke $(1,95-2,15)$ mm (from BDC) Zyl. 8

Rotational speed min ⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm ³ /1000 strokes 3	Difference in fuel delivery cm ³ /1000 strokes 4	Fuel delivery Checking values cm ³ /1000 strokes 5	Spring pre-tension (torque-control valve)
600	18,0	373,0-378,0	11,0 (16,0)	370,0-381,0	
600	9,0	143,0-163,0	14,0 (21,0)	138,0-166,0	
200	9,0	71,0-91,0	14,0 (21,0)	66,0-96,0	
1080	-	C, Sp. 2	8,0 (12,0)	C, Sp. 2	
375			8,0		

Adjust the fuel delivery from each outlet according to the values in

B. Governor settings

Upper rated speed			Medium rated speed			Lower rated speed			Torque control	
Control lever deflection degrees 1	mm min ⁻¹ 2	Control-rod travel mm min ⁻¹ 3	Control lever deflection degrees 4	mm min ⁻¹ 5	Control-rod travel mm min ⁻¹ 6	Control lever deflection degrees 7	mm min ⁻¹ 8	Control-rod travel mm min ⁻¹ 9	mm min ⁻¹ 10	Control-rod travel mm min ⁻¹ 11
max.	500	23,5-24,0	(Position of slider)			22	600	2,1-2,6	500	21,7-22,1
ca. 58	1100	19,0-19,5					150	12,0-14,0	700	20,9-21,5
	1130	15,0-18,0					250	10,4-12,4	1000	19,5-20,0
	1200	6,2-12,4					375	5,6-6,0	1100	19,0-19,5
	1250	0 - 7,8					500	2,3-3,1		
	1350	0 - 1,0				1100 0,4-1,6 1180 0	900	1,1-2,0		

Torque control travel a = 0,8 mm Speed regulation: At 1075-1085 min⁻¹ less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°)		Fuel-delivery characteristics		Starting fuel delivery		
min 1	cm ³ /1000 strokes 2	min 3	min 4	cm ³ /1000 strokes 5	min 6	cm ³ /1000 strokes 7
1080	232,0-236,0 (229,0-239,0)	1220 RW max. 5 mm	900	228,0-236,0 (224,0-240,0)	-	-
			700	228,0-236,0 (224,0-240,0)		
			500	216,0-224,0 (212,0-228,0)		

Checking values in brackets

12.83

Testoil-ISO 4113

Test specifications

Fuel injection pumps and governors

WPP 001/4 MTU 29,9 a

En.

10. Edition

PE 8 ZWM 140/120 RS 19/11 RQU 375/1100 ZWA 25 DR
Komb.-Nr. 0 406 038 019

Replaces 1.83
Firm MTU
Engine MB 837 A a

1 - 2 - 6 - 3 - 4 - 5 - 7 - 8 je $45^\circ \pm 0,5^\circ (\pm 0,75^\circ)$

Note VDT-W-Gen./7

Governor adjustment according to VDT-I-420/112

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

Port closing at prestroke $2,0-2,1$ mm (from BDC) Zyl. 8
(1,95-2,15)

Rotational speed min ⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm ³ /1000 strokes 3	Difference in fuel delivery cm ³ /1000 strokes 4	Fuel delivery Checking values cm ³ /1000 strokes 5	Spring pre-tension (torque-control valve)
600	18,0	373,0-378,0	11,0 (16,0)	370,0-381,0	-
600	9,0	143,0-163,0	14,0 (21,0)	138,0-166,0	
200	9,0	71,0-91,0	14,0 (21,0)	66,0-96,0	
1080	-	C, Sp. 2	8,0 (12,0)	C, Sp. 2	
380	-	-	8,0	-	

Adjust the fuel delivery from each outlet according to the values in

B. Governor settings

Upper rated speed			Medium rated speed			Lower rated speed			Torque control	
Control lever deflection degrees 1	mm min ⁻¹ 2	Control-rod travel mm min ⁻¹ 3	Control lever deflection degrees 4	min 5	Control-rod travel mm 6	Control lever deflection degrees 7	min 8	Control-rod travel mm 9	min 10	Control-rod travel mm 11
max.	500	23,5-24,0	(Position of slider)			22	600	2,1-2,6	500	21,7-22,1
ca. 58	1100	19,0-19,5					150	12,0-14,0	700	20,9-21,5
	1130	15,0-18,0					250	10,4-12,4	1000	19,5-20,0
	1200	6,2-12,4					375	5,6-6,0	1100	19,0-19,5
	1250	0 - 7,8				1100	0,4-1,6	500	2,3-3,1	
	1350	0 - 1,0			1180	0	900	1,1-2,0		

Torque control travel a = $0,8$ mm Speed regulation At 1075-1085 min⁻¹ control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°C)		Control rod stop		Fuel-delivery characteristics		Starting fuel delivery	
min ⁻¹ 1	cm ³ /1000 strokes 2	min ⁻¹ 3		min 4	cm ³ /1000 strokes 5	min 6	cm ³ /1000 strokes 7
1080	232,0-236,0 (229,0-239,0)	1220 RW max. 5 mm		900	228,0-236,0 (224,0-240,0)	100	18,0-18,2 mm RW
				700	228,0-236,0 (224,0-240,0)		idle stop 53,0-58,0
				500	216,0-224,0 (212,0-228,0)	375	

Checking values in brackets

12.83

* Limit the quantity at the excess-fuel stop.

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Testoil-ISO 4113

Test specifications

Fuel injection pumps and governors

WPP 001/4 MTU 29,9 e 1

2. Edition

En.

Replaces

Firm: 5.83

Engine: MTU
MB 837 Türkei

PE 8 ZWM 150/120 RS 1036 RQU 300-500/1150 ZWA 66 R

0 406 038 025 governor adjustment according to VDT-I-420/112

1-2-6-3-4-5-7-8 each 45° (± 0,75°)

Stamp prestroke dimension on top side of pump! Note VDT-W-Gen./7!

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

Port closing at prestroke ^{2,5-2,6}
(2,45-2,65) mm (from BDC) Cyl.8

Rotational speed min ⁻¹	Control-rod travel mm	Fuel delivery Average value cm ³ /1000 strokes	Difference in fuel delivery cm ³ /1000 strokes	Fuel delivery Checking values cm ³ /1000 strokes	Spring pre-tension (torque-control valve)
1	2	3	4	5	
1000	18,0	527,0-537,0	14,0 (21,0)	524,0-540,0	-
1000	9,0	175,0-195,0	12,0 (18,0)	170,0-200,0	
300	9,0	104,0-124,0	16,0 (24,0)	99,0-129,0	
1150	11,5		12,0 (18,0)		
700	12,5	Section C	16,0 (24,0)		
425			12,0		

Adjust the fuel delivery from each outlet according to the values in

B. Governor settings

Upper rated speed			Medium rated speed			Lower rated speed			Torque control	
Control lever deflection degrees	mm	Control-rod travel mm	Control lever deflection degrees	mm	Control-rod travel mm	Control lever deflection degrees	mm	Control-rod travel mm	mm	Control-rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca. 65	800	18,0-18,5	ca. 19	300	7,0	ca. 33	425	6,6-6,9	1100	10,0
	1150	11,5					300	13,0-15,0	800	10,8+0,2
	10,7	1210-1230					400	7,8- 9,0		
	5,0	1255-1280	ca. 39	500	7,0		500	1,0- 3,3	Preliminary examination	
	0	1295-1315					535	0 - 0,5		

Torque control travel a = 0,5 mm + 0,05

Speed regulation: At

1 mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°)		Shutoff solenoid	Fuel-delivery characteristics		Idle speed	
min ⁻¹	cm ³ /1000 strokes	min ⁻¹	min ⁻¹	cm ³ /1000 strokes	min ⁻¹	cm ³ /1000 strokes
1	2	3	4	5	6	7
1150	285,0-289,0 (283,0-291,0)	0,5, 1,5mm in front of stop	700	295,0-305,0 (292,0-3,0,0)	425	53,0-59,0
				*		

Checking values in brackets

* Limit the quantity at the excess-fuel stop

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Testoil-ISO 4113

Test specifications

Fuel injection pumps and governors

WPP 001/4MTU 22,4 d

2. Edition

En.

PE 6 ZWM 150/120 RS 1031/11 RQU 425/1200 ZWA 63 R
 Komb.-Nr. 0 406 036 031
 VDT-I 420/112; VDT-W-Gen./7

Replaces 3.83

Firm: MTU

Engine: MB 833-TAM

1 - 2 - 3 - 4 - 5 - 6 Please note instructions on sheet 2
 0 -45-120-165-240-285° ± 0,5° (± 0,75°)

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

Testoil-ISO 4113

A. Fuel-injection-pump settings

Port closing at prestroke $\frac{2,5-2,6}{(2,45-2,65)}$ mm (from BDC) $\frac{Zyl. 6}{1. 6}$

Rotational speed min ⁻¹	Control-rod travel mm	Fuel delivery Average value cm ³ /1000 strokes	Difference in fuel delivery cm ³ /1000 strokes	Fuel delivery Checking values cm ³ /1000 strokes	Spring pre-tension (torque-control valve)
1	2	3	4	5	
1000	18,0	523,0-533,0	16,0 (24,0)	520,0-536,0	-
1000	9,0	176,0-196,0	13,0 (19,9)	171,0-201,0	
300	9,0	113,0-133,0	14,0 (21,0)	108,0-138,0	
1200	11,9	C Sp. 2	10,0 (15,0)		
800			16,0 (24,0)		
425			9,0		

Adjust the fuel delivery from each outlet according to the values in

B. Governor settings

Upper rated speed			Medium rated speed			Lower rated speed			Torque control	
Control lever deflection degrees	mm	Control-rod travel mm	Control lever deflection degrees	min ⁻¹	Control-rod travel mm	Control lever deflection degrees	min ⁻¹	Control-rod travel mm	min ⁻¹	Control-rod travel mm
1	2	3	4	5	6	7	8	9	10	11
Max.	1200	18,0-18,5	-	-	-	ca. 23	425	6,5	-	-
	10,9	1220-1235					200	14,8-18,0		
	5,0	1250-1300					400	7,6-8,1		
	0	1320-1370					600	0,5-1,5		
							1200	0,5-1,5		
							1275	0		

Torque control travel a = mm Speed regulation: At 1225-1240 min⁻¹ less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°)		Control rod stop at speed	Fuel-delivery characteristics		Starting fuel delivery	Leerlauf
min	cm ³ /1000 strokes	min	min	cm ³ /1000 strokes	min	cm ³ /1000 strokes
1	2	3	4	5	6	7
1200	297,0-301,0 (295,0-303,0)	-	800	282,0-315,0 (278,0-319,0)	425	52,0-66,0

Checking values in brackets

11.83

BOSCH

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1. When testing the injection-pump combination, the oil-metering valve must be unscrewed to prevent destruction by running dry.
2. Set stop screw at 1 mm.
3. Set shutoff device to 0.5 - 1.5 mm

Test specifications

Fuel injection pumps and governors

WPP 001/4 MTU 22,4 d 1

En.

2. Edition

PE 6 ZWM 150/120 RS 1031/11 Z RQU 425/1200 ZWA 63 R
Komb.-Nr. 0 406 036 033

Replaces: 3.83

Firm: MTU

Engine: MB 833 - TAM

1- 2- 3 - 4 - 5 - 6
0-45-120-165-240-285° ± 0,5° (± 0,75°)

VDT-I-420/112; VDT-W-Gen./7. Please note instructions on sheet 2
All test specifications apply only to Bosch fuel-injection pump test benches and equipment

Testoil-ISO 4113

A. Fuel-injection-pump settings

Port closing at prestroke $\begin{matrix} 2,5-2,6 \\ (2,45-2,65) \end{matrix}$ mm (from BDZ) 1. 6

Rotational speed min ⁻¹	Control-rod travel mm	Fuel delivery Average value cm ³ /1000 strokes	Difference in fuel delivery cm ³ /1000 strokes	Fuel delivery Checking values cm ³ /1000 strokes	Spring pre-tension (torque-control valve)
1	2	3	4	5	
1000	18,0	523,0-533,0	16,0 (24,0)	520,0-536,0	-
1000	9,0	176,0-196,0	13,0 (19,0)	171,0-201,0	
300	9,0	113,0-133,0	14,0 (21,0)	108,0-138,0	
1200	13,2	C Sp. 2	11,0 (16,0)	C Sp. 2	
800			16,0 (24,0)		
425			9,0		

Adjust the fuel delivery from each outlet according to the values in

B. Governor settings

Upper rated speed			Medium rated speed			Lower rated speed			Torque control	
Control lever deflection degrees	mm	Control-rod travel min ⁻¹	Control lever deflection degrees	min ⁻¹	Control-rod travel mm	Control lever deflection degrees	min ⁻¹	Control-rod travel mm	min ⁻¹	Control-rod travel mm
1	2	3	4	5	6	7	8	9	10	11
max.	1200	18,0-18,5	-	-	-	ca. 23	425	6,5	-	-
	12,2	1225-1240					200	15,0-18,0		
	5,0	1280-1325					400	7,1-9,0		
	4,0	1290-1335					600	0,5-1,5		
	0	1320-1375					1200	0,5-1,5		
							1275	0		

Torque control travel a = mm Speed regulation: At 1225-1240 min⁻¹ less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°)		Control rod stop at speed	Fuel-delivery characteristics		Leerlauf delivery	
min ⁻¹	cm ³ /1000 strokes	min ⁻¹	min ⁻¹	cm ³ /1000 strokes	min ⁻¹	cm ³ /1000 strokes
1	2	3	4	5	6	7
1200	345,0-349,0 (343,0-351,0)	-	800	343,0-353,0 (340,0-356,0)	425	52,0-66,0

Checking values in brackets

11.83

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1. When testing the injection-pump combination, the oil-metering valve must be unscrewed to prevent destruction by running dry.
2. Set idle stop at $n = 425 \text{ min}^{-1}$ at 6.5 mm control-rod travel.
3. Set stop screw at 1 mm.
4. Set shutoff device to 0.5 - 1.5 mm.

Test specifications

Fuel injection pumps and governors

WPP 001/4 MTU 29,9 e

2. Edition

En.

40

PE 8 ZWM 159/120 RS 1036 RQU 300-500/1100 ZWA 66 R
 0 406 038 025 governor adjustment according to VDT-I-420/112
 1-2-6-3-4-5-7-8 each 45° (+ 0,75°)

Replaces 5.83
 Firm: MTU
 Engine: MB 837 Italien

Stamp prestroke dimension on top side of pump! Note VDT-W-Gen./7!

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

Port closing at prestroke ^{2,5-2,6} (2,45-2,65) mm (from BDC) cyl. 8

Rotational speed min ⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm ³ /1000 strokes 3	Difference in fuel delivery cm ³ /1000 strokes 4	Fuel delivery Checking values cm ³ /1000 strokes 5	Spring pre-tension (torque-control valve)
1000	18,0	527,0-537,0	14,0 (21,0)	524,0-540,0	-
1000	9,0	175,0-195,0	12,0 (18,0)	170,0-200,0	
300	9,0	104,0-124,0	16,0 (24,0)	99,0-129,0	
1100	12,3	C, col.2+5	14,0 (21,0)	C, col.2+5	
700	12,6		18,0 (27,0)		
425	6,7	C, col.7	12,0		

Adjust the fuel delivery from each outlet according to the values in

B. Governor settings

Upper rated speed			Medium rated speed			Lower rated speed			Torque control	
Control lever deflection degrees 1	mm 2	Control-rod travel min ⁻¹ 3	Control lever deflection degrees 4	min ⁻¹ 5	Control-rod travel mm 6	Control lever deflection degrees 7	min ⁻¹ 8	Control-rod travel mm 9	min ⁻¹ 10	Control-rod travel mm 11
ca. 65	800	18,0-18,5	ca. 19	300	7,0	ca. 33	425	6,6-6,9	1100	10,0
	1100	12,3					300	13,0-15,0	800	10,8+0,2
	11,3	1135-1145					400	7,8- 9,0		
	5,0	1185-1210	ca. 39	500	7,0		500	1,0- 3,3		
	0	1230-1260					535	0 - 0,5		
										Preliminary examination

Torque control travel a = 0,5 mm +0,05

Speed regulation: At

1 mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°)		Shutoff solenoid		Fuel-delivery characteristics		Idle speed	
min ⁻¹ 1	cm ³ /1000 strokes 2	min ⁻¹ 3		min ⁻¹ 4	cm ³ /1000 strokes 5	min ⁻¹ 6	cm ³ /1000 strokes 7
1100	302,0-306,0 (300,0-308,0)	0,5-1,5 mm in front of stop		700	308,0-318,0 (305,0-321,0) *	425	51,0-61,0
* Limit the quantity at the excess-fuel stop							

Checking values in brackets

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11.83

E5

E5

Test Specifications

Distributor-type

Fuel-injection Pumps

VE 6/11 F 1800 L 18-3

0 460 416 027

supersedes -

company: Volvo

engine: TD 40 A (93 kW)

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting 0,3 mm

see VDT-W-4601

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1500	3,6-4,0 mm		
1.2 Supply pump pressure	1500	6,6-7,2 bar (kgf/cm ²)		
1.3 Full-load delivery without charge-air pressure	1500	62,0-63,0 cm ³ /1000 strokes		2,5 (3,0)
Full-load delivery with charge-air pressure	-	- cm ³ /1000 strokes		
1.4 Idle speed regulation	325	8,0-12,0 cm ³ /1000 strokes		2,5 (3,0)
1.5 Start	100	min. 60,0 cm ³ /1000 strokes		
1.6 Full-load speed regulation	2000	19,0-25,0 cm ³ /1000 strokes		
1.7 Load-dependent start of delivery				

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	1100 1,6-2,4 (1,3-2,7)	1500 (3,1-4,5)	1800 4,5-5,3 (4,2-5,6)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	400 2,8-3,4		1800 7,7-8,3
Overflow delivery	n = rev/min cm ³ /10 s	500 55-138 (40-153)		1800 55-138 (40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2100 2000 1900 1800 1500 500 500	max. 2,0 (17,0-27,0) 39,0-49,0 (39,0-49,0) 56,3-59,3 (55,55-60,05) (60,25-64,75) 50,0-52,0 (48,25-53,75) 43,5-45,5 (41,75-47,25)	
switch-off			
Idle stop	400 325	max. 3,0 (6,0-14,0)	
End stop	110 220	min. 60 max. 40	
2.4 Solenoid	max. cut-in voltage xxx min. 10 V xxx rated voltage 12V.		

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	-
KF	5,9-6,2
MS	1,2-1,4
SVS	max. 4,7
XK	20,2-22,2
XL ^B	10,4-16,4

Observations

Test Specifications Distributor-type Fuel-injection Pumps

WPP 001/4 Vol 3,6 g1

3. Edition

En

superseded by 5.83
company: Volvo
engine: TAMD 40 B (121 kW)

VE 6/11 F 1800 L 19-7
0 460 416 025

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting 0,2 mm \pm 0,02 (0,04)

see VDT-W-460/..

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1500	2,6- 3,0 mm		
1.2 Supply pump pressure	1500	6,2- 6,8 bar (kgf/cm ²)		
1.3 Full-load delivery without charge-air pressure	1500	78,0-79,0 cm ³ /1000 strokes		3,0(3,5)
Full-load delivery with charge-air pressure	-	- cm ³ /1000 strokes		
1.4 Idle speed regulation	400	8,5-12,5 cm ³ /1000 strokes		3,0(3,5)
1.5 Start	100	min.60 cm ³ /1000 strokes		
1.6 Full-load speed regulation	1900	43,5-49,5 cm ³ /1000 strokes		
1.7 Load-dependent start of delivery	-	-		

2. Test Specifications checking values in brackets ()

2.1 Timing device	n = rev/min mm	1000 0,7-1,5(0,4-1,8)	1500 (2,1-3,5)	1750 3,6-4,4(3,-4,7)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	400 2,3-2,9		1750 7,1-7,7
Overflow delivery	n = rev/min cm ³ /10 s	600 55-138(40-153)		1800 55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2130 2050 1900 1770 1500 600	max. 2,5 6,5-12,5(5,0-14,0) (42,0-51,0) 72,8-75,8 (71,6-77,0) (75,8-81,2) 68,0-72,0 (66,6-73,4)	

switch-off

Idle stop	580 500 400	0 max. 2,0 (6,0-15,0)	
End stop	120 220	min.60 max.60	

2.4 Solenoid	max. cut-in voltage XXX min. 10 V rated voltage 12V.
--------------	--

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	-
KF	5,9-6,1
MS	0,9-1,1
SVS	max. 2,3
AK	18,7-20,7
B XL	10,9-14,2

Observations

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Test Specifications Distributor-type Fuel-injection Pumps

46

WPP 001/4 Vol 3,6p

1. Edition

En

VE 6/11 F 1625 L 19-9

0 460 416 030

supersedes-

company: Volvo-Penta

engine: TAMD 40 B - 105 kW

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

see VDT-W-460/...

Pre-stroke setting 0,2 mm

Testoil ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1500	2,6-3,0 mm		
1.2 Supply pump pressure	1500	6,2-6,8 bar (kgf/cm ²)		
1.3 Full-load delivery without charge-air pressure	1500	72,5-73,5 cm ³ /1000 strokes		3,5
Full-load delivery with charge-air pressure	-	- cm ³ /1000 strokes		
1.4 Idle speed regulation	400	8,5-12,5 cm ³ /1000 strokes		3,5
1.5 Start	100	min. 60,0 cm ³ /1000 strokes		
1.6 Full-load speed regulation	1900	15,0-23,0 cm ³ /1000 strokes		
1.7 Load-dependent start of delivery	-			

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	1000 0,7-1,5(0,4-1,8)	1500 (2,1-3,5)	1625 3,0-3,8(2,7-4,1)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	400 2,3-2,9		1625 6,7-7,3
Overflow delivery	n = rev/min cm ³ /10 s	600 55-138(40-153)		1625 55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2000	max. 10,0	
	1900	(14,5-23,5)	
	1800	32,5-38,5 (31,0-40,0)	
	1625	66,0-69,0 (64,8-70,2)	
	1500	72,5-73,5 (70,3-75,7)	
	600	58,0-62,0 (56,7-63,4)	
switch-off			
Idle stop	580	0	
	500	max. 2,0	
	400	(6,0-15,0)	
End stop	110	min. 60,0	
	210	max. 50,0	

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	-
KF	5,9-6,1
MS	0,9-1,1
SVS	max. 4,9
A	
B	

Observations

Pushing electro-
magnet

2.4 Solenoid max. cut-in voltage xxx min. 10,0 V
xxxxxxxx rated voltage 12V.
rest voltage

3,84

Test Specifications

Distributor-type

Fuel-injection Pumps

WPP 001/4 VWV 2,4 k

1. Edition

En

VE 6/10 F 2400 L 32-2

0 460 406 037

supersedes

company: VWV

engine: 087/10

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test instructions and Test Equipment

Pre-stroke setting

=

mm

see VDT-W-460/

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1500	2,8-3,2 mm		
1.2 Supply pump pressure	1500	5,2-5,8 bar (kgf/cm ²)		
1.3 Full-load delivery without charge-air pressure	1500	28,5-29,5 cm ³ /1000 strokes		2,5
Full-load delivery with charge-air pressure	-	cm ³ /1000 strokes		
1.4 Idle speed regulation	375	6,0-11,0 cm ³ /1000 strokes		2,0
1.5 Start	100	min. 38,0 cm ³ /1000 strokes		
1.6 Full-load speed regulation	2700	6,0-12,0 cm ³ /1000 strokes		
1.7 Load-dependent start of delivery	-			

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	1000 0,8-1,6 (0,5-1,9)	1500 (2,3-3,7)	2400 6,0-6,8 (5,7-7,1)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	600 2,8-3,4		2400 7,7-8,3
Overflow delivery	n = rev/min cm ³ /10 s	600 55-138 (40-153)		2400 55-138 (40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2800 2700 2400 1500 750	max. 40 (5,0-13,0) 22,0-24,0 (20,7-25,3) (26,7-31,3) 26,0-29,0 (24,5-30,5)	
switch-off	70-400	0	
Idle stop	375 600	(4,0-12,0) max. 4,0	
End stop	400 500	min. 20,0 max. 25,0	
2.4 Solenoid	max. cut-in voltage XXX min. 10 V. rated voltage 12V.		

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	3,2-3,4
KF	6,4-6,6
MS	1,5-1,7
SVS	3,6
A	
B	

Observations

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⑥

Test Specifications

Distributor-type

Fuel-injection Pumps

46

WPP 001/4 VW 2,4 k 2

1. Edition

En

VE 6/10 F 2400 L 32-3

0 460 406 038

supersedes -

company VW

engine 087/10

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting - mm

see VDT-W-460/.

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1500	2,8-3,2 mm		
1.2 Supply pump pressure	1500	5,2-5,8 bar (kgf/cm ²)		
1.3 Full-load delivery without charge-air pressure	1500	28,5-29,5 cm ³ /1000 strokes		2,5
Full-load delivery with charge-air pressure	-	cm ³ /1000 strokes		
1.4 Idle speed regulation	375	6,0-10,0 cm ³ /1000 strokes		2,0
1.5 Start	100	min. 38 cm ³ /1000 strokes		
1.6 Full-load speed regulation	2700	6,0-12,0 cm ³ /1000 strokes		
1.7 Load-dependent start of delivery	-			

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	1000 0,8-1,6 (0,5-1,9)	1500 (2,3-3,7)	2400 6,0-6,8 (5,7-7,1)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	600 2,8-3,4		2400 7,7-8,3
Overflow delivery	n = rev/min cm ³ /10 s	600 55-138 (40-153)		2400 55-138 (40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2800 2700 2400 1500 750	max. 4,0 (5,0-13,0) 22,0-24,0 (20,7-25,3) (26,7-31,5) 26,0-29,0 (24,5-30,5)	
switch-off elektr. mech.	70-400 2400	0 0	
Idle stop	600 375	max. 4,0 (4,0-12,0)	
End stop	400 500	min. 20,0 max. 25,0	

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	3,2-3,4
KF	6,4-6,6
MS	1,5-1,7
SVS	3,6
A	
B	

Observations

2.4 Solenoid	max. cut-in voltage xxx min. 10,0 V rated voltage 12V.
--------------	---

3.84

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E10

E10

Test Specifications

Distributor-type

Fuel-injection Pumps

VE 4/9 F 2100 R 48
0 460 494 039

supersedes 9.82
company VWV
engine EA 162/1,6

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

--

mm

see VDT-W-460/

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1500	3,3- 3,7 mm		
1.2 Supply pump pressure	1500	4,8- 5,4 bar (kgf/cm ²)		
1.3 Full-load delivery without charge-air pressure	1500	33,0-34,0 cm ³ /1000 strokes		2,5(3,0)
Full-load delivery with charge-air pressure	-	- cm ³ /1000 strokes		
1.4 Idle speed regulation	415	6,0-10,0 cm ³ /1000 strokes		2,0(3,0)
1.5 Start	100	min. 35,0 cm ³ /1000 strokes		
1.6 Full-load speed regulation	2300	11,5-17,5 cm ³ /1000 strokes		
1.7 Load-dependent start of delivery	-	-		

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	1000 1,2-2,0(0,9-2,3)	1500 (2,8-4,2)	2100 5,4-6,2(5,1-6,5)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	400 2,1-2,7		2100 6,3-6,9
Overflow delivery	n = rev/min cm ³ /10 s	600 55-138(40-153)		2100 55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)	3. Dimensions for assembly and adjustment mm
End stop	2450-2550 2400 2300 2100 1500 600	0 max. 5,5 (10,5-18,5) 28,0-30,0 (26,7-31,3) (31,2-35,8) 21,5-24,5 (20,0-26,0)		K 3,2- 3,4 KF 5,7- 5,9 MS 1,3- 1,5 SVS max. 4,8 + FH 1,8- 2,4
switch-off elektr.	400	0		A XK 18,6-20,6 B XL 7,5-10,8
Idle stop	2000 450 415	max. 3,0 min. 2,0 (4,0-12,0)		Observations
End stop	400 500	min. 17 max. 23		+ *operating stroke (KSB)
2.4 Solenoid	max. cut-in voltage test voltage	xxx min. 10,0 V rated voltage 12V.		

Test Specifications

Distributor-type

Fuel-injection Pumps

WPP 001/4 VWV 1,6t

3. Edition

En

VE 4/9 F 2100 R 48-2 (P)

0 460 494 102; 103

Overflow temperature 45° C

superseded 10.82

company VWV

engine: Typ 2 USA

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

mm

see VDT-W-460/

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1500	3,3- 3,7	mm	
1.2 Supply pump pressure	1500	4,8- 5,4	bar (kgf/cm ²)	
1.3 Full-load delivery without charge-air pressure	1500	33,0-34,0	cm ³ /1000 strokes	2,5(3,0)
Full-load delivery with charge-air pressure	-	-	cm ³ /1000 strokes	
1.4 Idle speed regulation	415	6,0-10,0	cm ³ /1000 strokes	2,0(3,0)
1.5 Start	100	min. 35,0	cm ³ /1000 strokes	
1.6 Full-load speed regulation	2300	11,5-17,5	cm ³ /1000 strokes	
1.7 Load-dependent start of delivery	-	-		

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	1000 1,2-2,0(0,9-2,3)	1500 (2,8-4,2)	2100 5,4-6,2(5,1-6,5)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	400 21,-2,7		2100 6,3-6,9
Overflow delivery	n = rev/min cm ³ /10 s	600 55-138 (40-153)		2100 55-138 (40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2450-2550 2400 2300 2100 1500 600	max. 5,5 (10,5-18,5) 28,0-30,0 (26,7-31,3) (31,2-35,8) 21,5-24,5 (20,0-26,0)	0
switch-off elektr.	400	0	
Idle stop	2000 450 415	max. 3,0 min. 2,0 (4,0-12,0)	
End stop	400 500	min. 17 max. 23	

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	3,2-3,4
KF	5,7-5,9
MS	1,3-1,5
SVS	max. 4,8
+ FH	1,8-2,4
XK	18,6-20,6
XL	7,5-10,8
A	
B	

Observations

+ *operating
stroke (KSB)

2.4 Solenoid	max. cut-in voltage xxx min. 10,0 V rated voltage 12V.
--------------	---

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04.84

Test Specifications

Distributor-type

Fuel-injection Pumps

WPP 001/4 PEU 2,3 b 3

1. Edition

En

VE 4/10 F 2075 R 62 0 460 404 011
 DHK: 1 688 901 022/130 bar
 Test pressure line 1 Overflow temperature 45° C
 6x2x450 mm / 1 680 750 073

supersedes Peugeot
 company: XD 2 S
 engine:

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting - mm

see VDT-W-460/..

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1400	5,2- 5,6 mm	0,67	
1.2 Supply-pump pressure	1400	5,2- 5,8 bar (kgf/cm ²)	0,67	
1.3 Full-load delivery with charge-air pressure	1250	47,5-48,5 cm ³ /1000 strokes	0,67	2,0(3,0)
Full-load delivery without charge-air pressure	500	36,0-37,0 cm ³ /1000 strokes	0	
1.4 Idle regulation	375	12,0-16,0 cm ³ /1000 strokes	0	2,0(3,0)
1.5 Full-speed regulation	2400	12,0-18,0 cm ³ /1000 strokes	0,67	
1.6 Start	100	min. 57,0 cm ³ /1000 strokes	0	
1.7 Load-dependent port-closing	1400	-	0,67	

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min	750	1400	2000
LDA=0,67 bar	mm	1,7-2,5 (1,4-2,8)	(4,7-6,1)	7,9-8,7(7,6-9,0)
2.2 Supply pump	n = rev/min	400		2000
LDA=0,67 bar	bar (kgf/cm ²)	2,1-2,7		7,1-7,7
Overflow delivery	n = rev/min	500 (0 bar)		2075 (0,67 bar)
	cm ³ /10 s	55-138 (40-153)		55-138 (40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2500	5,0-11,0 (4,0-12,0)	0,67
	2400	(11,0-19,0)	0,67
	2000	45,0-48,0 (44,2-48,8)	0,67
	1250	(45,7-50,3)	0,67
	*750	45,5-46,5 (43,0-49,0)	0,25
	500	(33,5-39,5)	0
switch-off			
	2075	0	
Idle stop	375	(10,0-18,0)	
	420-480	0	
	1250	max. 2,0	
End stop	320	min. 52	
	420	max. 52	
2.4 Solenoid	max. cut-in voltage	xxx min. 10 V	
	test voltage	rated voltage 12V.	

3. Dimensions

Designation	for assembly and adjustment mm
K	Maß K 1
KF	5,7-5,9
MS	0,9-1,1
SVS	max. 4,6
A XK	20,2-22,2
B XL	9,5-12,8

Observations

* Manifold-pressure
 compensator stroke
 = 3,5 mm
 Correction at the
 adjusting nut. (46)

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Test Specifications Distributor-type Fuel-injection Pumps

WPP 001/4 PEU 2,3 b 2

1. Edition

En

VE 4/10 F 2125 R 62-2 0 460 404 018

DHK: 1 688 901 022/130 bar

Test pressure line

6x2x450 mm / 1 680 750 073 Overflow temperature 45° C

supersedes Peugeot

company: XD 2 S 81A

engine:

Testoil ISO 4113

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting mm

see VDT-W-460/..

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1400	5,2-5,6 mm	0,67	
1.2 Supply-pump pressure	1400	5,2-5,8 bar (kgf/cm ²)	0,67	
1.3 Full-load delivery with charge-air pressure	1250	47,5-48,5 cm ³ /1000 strokes	0,67	2,0(3,0)
Full-load delivery without charge-air pressure	500	36,0-37,0 cm ³ /1000 strokes	0	
1.4 Idle regulation	425	12,0-16,0 cm ³ /1000 strokes	0	2,0(3,0)
1.5 Full-speed regulation	2450	12,0-18,0 cm ³ /1000 strokes	0,67	
1.6 Start	100	min. 57,0 cm ³ /1000 strokes	0	
1.7 Load-dependent port-closing	1400	-	0,67	

2. Test Specifications checking values in brackets ()

2.1 Timing device	n = rev/min	750	1400	2000
LDA=0,67 bar	mm	1,7-2,5 (1,4-2,8)	(4,7-6,1)	7,9-8,7(7,6-9,0)
2.2 Supply pump	n = rev/min	400		2000
LDA=0,67 bar	bar (kgf/cm ²)	2,1-2,7		7,1-7,7
Overflow delivery	n = rev/min cm ³ /10 s	500 (0 bar) 55-138 (40-153)		2125 (0,67 bar) 55-138 (40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2550	5,0-11,0 (4,0-12,0)	0,67
	2450	(11,0-19,0)	0,67
	2000	45,0-48,0 (44,2-48,8)	0,67
	1250	(45,7-50,3)	0,67
	*750	45,5-46,5 (43,0-49,0)	0,25
	500	(33,5-39,5)	0
switch-off	2125	0	
Idle stop	425	(10,0-18,0)	
	460-590	0	
End stop	1250	max. 2,0	
	320	min. 52	
	420	max. 52	
2.4 Solenoid	max. cut-in voltage	xxx min. 10 V	
	test voltage	xxxxxx rated voltage 12V.	

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	Maß K 1
KF	5,7-5,9
MS	0,9-1,1
SVS	max. 4,5
A XK	20,2-22,2
B XL	9,5-12,8

Observations

Manifold-pressure
compensator stroke
= 3,5 mm
Correction at the
adjusting nut. (46)

Test Specifications

Distributor-type

Fuel-injection Pumps

En

46

WPP 001/4 PEU 2,3 b

2. Edition

Testoil-ISO 4113

VE 4/10 F 2075 R 62-3

0 460 404 021

Overflow temperature 45° C

 supersedes 11.82
 company: Peugeot
 engine: XD 2 S

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

- mm

see VDT-W-460/.

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1400	5,0-5,4 mm	0,67	
1.2 Supply-pump pressure	1400	5,2-5,8 bar (kgf/cm ²)	0,67	
1.3 Full-load delivery with charge-air pressure	1200	48,7-49,7 cm ³ /1000 strokes	0,67	
Full-load delivery without charge-air pressure	500	33,5-34,5 cm ³ /1000 strokes	0	3,0
1.4 Idle regulation	375	12,0-16,0 cm ³ /1000 strokes	0	2,5
1.5 Full-speed regulation	2400	13,0-19,0 cm ³ /1000 strokes	0,67	
1.6 Start	100	min. 50 cm ³ /1000 strokes	0	
1.7 Load-dependent port-closing	1400	-		

2. Test Specifications

checking values in brackets ()

2.1 Timing device LDA=0,67 bar	n = rev/min mm	750 1,4-2,2(1,1-2,5)	1400 (4,5-5,9)	2000 7,8-8,6(7,5-8,9)
2.2 Supply pump LDA=0,67 bar	n = rev/min bar (kgf/cm ²)	400 2,1-2,7		2000 7,1-7,7
Overflow delivery	n = rev/min cm ³ /10 s	500 55-138(40-153)		2075 55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed, rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2500	3,0-9,0 (2,0-10,0)	0,67
	2400	(12,0-20,0)	0,67
	2000	41,8-44,2 (40,7-45,3)	0,67
	1250	(46,9-51,5)	0,67
	* 750	39,5-40,5 (37,7-42,3)	0,25
	500	(31,0-37,0)	0
switch-off	2075	0	
Idle stop	375 420-480 1250	0 max. 2,0	(10,0-18,0)
End stop	300 420	min. 50 max. 40	

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	Maß K 1
KF	5,7-5,9
MS	0,9-1,1
SVS	max. 4,6
XL	20,2-22,2
B XL	9,5-12,8

Observations
*
 Manifold-pressure
 compensator stroke
 = 3,5 mm
 Correction at the
 adjusting nut. (46)

2.4 Solenoid

 max. cut-in voltage xxx min. 10 V
 max. rated voltage 12V.

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1.84

Test Specifications Distributor-type Fuel-injection Pumps

Testoil-ISO 4113

VE 4/10 F 2125 R 62-4 Overflow temperature 45° C
0 460 404 022

supersedes 11.82
company: Peugeot
engine: XD 2 S

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test instructions and Test Equipment

see VDT-W-460/.

Pre-stroke setting - mm

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1400	5,0-5,4 mm	0,67	
1.2 Supply-pump pressure	1400	5,2-5,8 bar (kgf/cm ²)	0,67	
1.3 Full-load delivery with charge-air pressure	1250	48,7-49,7 cm ³ /1000 strokes	0,67	
Full-load delivery without charge-air pressure	500	33,5-34,5 cm ³ /1000 strokes	0	3,0
1.4 Idle regulation	425	8,0-12,0 cm ³ /1000 strokes	0	2,5
1.5 Full-speed regulation	2425	17,0-23,0 cm ³ /1000 strokes	0,67	
1.6 Start	100	min. 50 cm ³ /1000 strokes	0	
1.7 Load-dependent port-closing	1400	-		

2. Test Specifications checking values in brackets ()

2.1 Timing device LDA=0,67 bar	n = rev/min mm	750 1,4-2,2 (1,1-2,5)	1400 (4,5-5,9)	2000 7,8-8,6 (7,5-8,9)
2.2 Supply pump LDA=0,67 bar	n = rev/min bar (kgf/cm ²)	400 2,1-2,7		2000 7,1-7,7
Overflow delivery	n = rev/min cm ³ /10 s	500 55-138 (40-153)		2125 55-138 (40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2550	5,0-11,0 (4,0-12,0)	0,67
	2425	(16,0-24,0)	0,67
	2000	41,8-44,2 (40,7-45,3)	0,67
	1250	(46,9-51,5)	0,67
	* 750	39,5-40,5 (37,7-42,3)	0,25
	500	(31,0-37,0)	0
switch-off	2125	0	
Idle stop	425	(6,0-14,0)	
	460-590	0	
End stop	300	min. 50	
	420	max. 40	
2.4 Solenoid	max. cut-in voltage xxx min. 10 V test voltage xxx rated voltage 12V.		

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	Maß K 1
KF	5,7-5,9
MS	0,9-1,1
SVS	max. 4,5
*K	20,2-22,2
*L	9,5-12,8

Observations

*

Manifold-pressure
compensator stroke
= 3,5 mm
Correction at the
adjusting nut. (46)

Test Specifications

Distributor-type

Fuel-injection Pumps

VE 3/10 F 1800 L 70

0 460 403 004

supersedes
company Bukh
engine DV 36 TME

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test instructions and Test Equipment

Pre-stroke setting 0,2 mm

see VDT-W-460/

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1200	2,9- 3,3 mm	0,65	
1.2 Supply pump pressure	1200	5,1- 5,7 bar (kgf/cm ²)	0,65	
1.3 Full-load delivery without charge-air pressure	600	31,0-33,0 cm ³ /1000 strokes	0	2,5(3,0)
Full-load delivery with charge-air pressure	1200	45,0-47,0 cm ³ /1000 strokes	0,65	
1.4 Idle speed regulation	450	5,5- 9,5 cm ³ /1000 strokes	0	2,5(3,0)
1.5 Start	100	min. 35,0 cm ³ /1000 strokes	0	
1.6 Full-load speed regulation	1850	20,0-26,0 cm ³ /1000 strokes	0,65	
1.7 Load-dependent start of delivery	--	--		

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	900 1,1-1,9(0,8-2,2)	1200 (2,4-3,8)	1600 5,0-5,8(4,7-6,1)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	200 0,8-1,4		1800 8,0-8,5
Overflow delivery	n = rev/min cm ³ /10 s	500 55-138(40-153)		1800 55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	max. 2000	1,0	0,65
	1900	2,0- 8,0 (1,0 - 9,0)	0,65
	1850	(19,0 -27,0)	0,65
	1800	43,2-43,3 (41,05-45,45)	0,65
	1200	(43,8 -48,2)	0,65
	+ 600	36,5-38,5 (34,5 -40,5)	0,27
	600	(29,0 -35,0)	0
switch-off	1800	0	
Idle stop	450	(3,5-11,5)	0
	480	min. 1,5	
	530	max. 1,5	0
End stop	450	min.38,0	
	580	max.36,0	
2.4 Solenoid	max. cut-in voltage	XXX min 10,0 V	
	rated voltage	12V.	

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	-
KF	5,9- 6,1
MS	0,7- 0,9
SVS	max. 4,2
XL	20,2-22,2
XL	12,5-15,8

Observations

+

Manifold-pressure
compensator stroke
= 4,0 mm.
Correction at the
adjusting nut. (46)

Test Specifications

Distributor-type

Fuel-injection Pumps

WPP 001/4 Ope 1,6 d

4. Edition

En

VE 4/9 F 2300 R 82

O 460 494 071

superseded 9.83

company Opel

engine 2033-1,6 l

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

- mm

see VDT-W-460/

1. Settings

	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1500	3,1-3,5 mm		
1.2 Supply pump pressure	1500	5,0-5,6 bar (kgf/cm ²)		
1.3 Full-load delivery without charge-air pressure	1500	28,5-29,5 cm ³ /1000 strokes		2,5
Full-load delivery with charge-air pressure	-	- cm ³ /1000 strokes		
1.4 Idle speed regulation	450	6,0-10,0 cm ³ /1000 strokes		2,5
1.5 Start	100	min. 40,0 cm ³ /1000 strokes		
1.6 Full-load speed regulation	2640	17,0-23,0 cm ³ /1000 strokes		
1.7 Load-dependent start of delivery	1500 **	-		

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	1200 1,4-2,2 (1,1-2,5)	1500 (2,6-4,0)	2300 6,8-7,6 (6,5-7,9)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	600 2,4-3,0		2300 7,3-7,9
Overflow delivery	n = rev/min cm ³ /10 s	500 55-138 (40-153)		2300 55-138 (40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	3000	max. 5,0	
	2800	7,0-13,0 (6,0-14,0)	
	2640	(16,0-24,0)	
	2300	27,4-29,4 (26,1-30,7)	
	1500	(26,7-31,3)	
	600	23,2-26,2 (21,7-27,7)	

switch-off

2300

0

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	3,2-3,4
KF	5,7-5,9
MS	1,2-1,4
S/S	max. 2,0
* FH	1,8-2,4
AXK	24,2-26,2
EXL	9,9-13,2

Idle stop

1200

0

650

2,0-7,0

(0,5-8,5)

450

(4,0-12,0)

End stop

400

min. 30

500

max. 28

Observations

* operating stroke (KSB)
 **As of FD 349 (9.83) no setting of
 load-dependent start of delivery point.

2.4 Solenoid

max. cut-in voltage xxx min. 10 V
 test voltage xxx rated voltage 12V.

⑥

Test Specifications Distributor-type Fuel-injection Pumps

46

WPP 001/4 VWW 1,6 v 3

3. Edition

En

VE 4/9 F 1000 R 85-5

0 460 494 092

supersedes
company
engine

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

mm

see VDT-W-460/

Testoil-ISO 4113

1. Settings

	Rot. speed rev/min	Settings	Charge-air press bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1000	1,5- 1,9 mm		
1.2 Supply pump pressure	1000	3,1- 3,7 bar (kgf/cm ²)		
1.3 Full-load delivery without charge-air pressure	1000	24,5- 25,5 cm ³ /1000 strokes		2,5(3,0)
Full-load delivery with charge-air pressure	-	- cm ³ /1000 strokes		
1.4 Idle speed regulation	-	- cm ³ /1000 strokes		
1.5 Start	100	min. 35,0 cm ³ /1000 strokes		
1.6 Full-load speed regulation	1100	12,0- 18,0 cm ³ /1000 strokes		
1.7 Load-dependent start of delivery	-	-		

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	700 0,3-1,1(0-1,4)	1000 (1,0-2,4)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	600 2,2-2,8	
Overflow delivery	n = rev/min cm ³ /10 s	600 55-138(40-153)	1000 55-138(40-153)
2.3 Fuel deliveries			
Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press bar (kgf/cm ²)
End stop	1250	max. 3,0	
	1100	(11,0-19,0)	
	1000	(22,7-27,3)	
	600	17,5-20,5 (16,5-22,5)	
switch-off	1000	0	
Idle stop			
End stop	400 500	min. 14 max. 19,5	
2.4 Solenoid			
	cut-in voltage	xxx min.	10,0 V
	Rated voltage		12,0 V

3. Dimensions	
for assembly and adjustment mm	
Designation	
K	3,2-3,4
KF	5,7-5,9
MS	1,2-1,4
SVS	max. 2,5
+ FH	1,8-2,4
A	18,4-20,4
XK	
B	
XL	5,9- 8,3
Observations	
+ operating stroke (cold-start accel.)	

E19

E19

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4.84

Test Specifications

Distributor-type

Fuel-injection Pumps

WPP 001/4 STE 5,0d
2. Edition

En

VE 6/11 F 1150 R 92

0 460 416 020

supersedes

company: Steyr

engine: WD 611.85

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting 0,2 mm + 0,02(0,04)

see VDT-W-460/

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1000	5,3- 5,7 mm		
1.2 Supply pump pressure	1000	6,2- 6,8 bar (kgf/cm ²)		
1.3 Full-load delivery without charge-air pressure	1100	65,0-66,0 cm ³ /1000 strokes		3,5
Full-load delivery with charge-air pressure	-	- cm ³ /1000 strokes		
1.4 Idle speed regulation	300	14,0-18,0 cm ³ /1000 strokes		3,5
1.5 Start	100	min. 65,0 cm ³ /1000 strokes		
1.6 Full-load speed regulation	1200	24,5-30,5 cm ³ /1000 strokes		
1.7 Load-dependent start of delivery	-	-		

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	700 1,6-2,4(1,3-2,7)	1000 (4,8-6,2)	1150 6,8-7,6(6,5-7,9)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	300 2,6-3,2		1150 7,0-7,6
Overflow delivery	n = rev/min cm ³ /10 s	500 55-138(40-153)		1150 55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	1300 1250 1200 1100 800 500	max. 1,0 min. 1,5 (23,0-32,0) (62,8-68,2) 61,0-63,0 57,5-60,5 (59,3-64,7) (55,6-62,4)	
switch-off	1150	0	
Idle stop	300 350 420	min. 1,5 max. 1,0 (11,5-20,5)	
End stop	170 250	min. 65 max. 52	

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	--
KF	5,2-5,4
MS	1,3-1,5
SVS	max. 6,0
AK	20,2-22,2
B	
XL	10,5-13,8

Observations

2.4 Solenoid

max. cut-in voltage
test voltage
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04.34

Test Specifications

Distributor-type

Fuel-injection Pumps

WPP 001/4 REN 2,0 e

5. Edition

En

VE 4/9 F 2400 R 95

Overflow temperature 45° C

0 460 494 105

 supersedes 10.83
 company: Renault
 engine: F 8 M

DHK: 1 688 901 022/130 bar

Test pressure line

6x2x450 mm / 1 680 750 073

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

mm

see VDT-W-460/

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1400	4,1-4,5 mm		
1.2 Supply-pump pressure	1400	4,9-5,5 bar (kgf/cm ²)		
1.3 Full-load delivery with charge-air pressure	1000	27,8-28,8 cm ³ /1000 strokes		2,5 (3,0)
Full-load delivery without charge-air pressure	-	- cm ³ /1000 strokes		
1.4 Idle regulation	425	6,0-10,0 cm ³ /1000 strokes		2,0 (3,0)
1.5 Full-speed regulation	2650	10,5-16,5 cm ³ /1000 strokes		
1.6 Start	100	min. 42,0 cm ³ /1000 strokes		
1.7 Load-dependent port-closing	1400	-		

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	Siehe Blatt 2	
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	600 2,5-3,1	-2400 7,7-8,3
Overflow delivery	n = rev/min cm ³ /10 s	600 55-138 (40-153)	2400 55-138 (40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2800	max. 6,0	
	2650	(9,5-17,5)	
	2500	21,0-29,0 (21,0-29,0)	
	2400	29,2-31,8 (28,2-32,8)	
	2100	29,9-32,3 (28,8-33,4)	
	1400	27,5-29,5 (26,2-30,8)	
	1000	(26,0-30,6)	
	600	25,7-28,7 (24,2-30,2)	

switch-off

2400

0

Idle stop

650

600

425

0

0,2-5,2

(4,0-12,0)

End stop

330

500

min. 30,0

max. 29,0



2.4 Solenoid

max. cut-in voltage xxxx min. 10,0 V

test voltage rated voltage 12V

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	3,2-3,4
KF	5,7-5,9
MS	1,2-1,4
SVS	2,8
 K	18,7-20,7
 L	9,5-12,8

Observations

Please note instruc-
tions on sheet 2

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2.1 Timing device

<u>n = min/1</u>	<u>mm</u>
600	0,7-1,5 (0,4-1,8)
1000	2,3-3,1 (2,0-3,4)
1400	(3,6-5,0)
2000	6,3-7,1 (6,0-7,4)
2100	6,7-7,5 (6,4-7,8)
2400	7,0-7,7 (6,6-8,0)

Testing the hydr. cold-start accelerator:

Apply 12 V to expansion element of hydr. cold-start accelerator.

At 300 1/min there must be a timing-device travel of 1.3 - 3.3 mm.

Test Specifications

Distributor-type

Fuel-injection Pumps

WPP 001/4 BMW 2,4 a

1. Edition

En

Testoil-ISO 4113

VE 6/10 F 2400 R 121

0 460 406 022

DHK: 1 688 901 022 / 130 bar

Test pressure line

6x2x450 mm / 1 680 750 073

Overflow temperature 45° C

supersedes -

company BMW

engine: M 21 D 24-Europa

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

-

mm

see VDT-W-460/.

1. Settings	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1500	4,3-4,7	mm	1,050	
1.2 Supply pump pressure	1500	6,1-6,5	bar (kgf/cm ²)	1,050	
1.3 Full-load delivery without charge-air pressure	500	28,0-29,0	cm ³ /1000 strokes	0	3,0
Full-load delivery with charge-air pressure	1500	40,8-41,8	cm ³ /1000 strokes	1,050	2,5
1.4 Idle speed regulation	400	6,0-10,0	cm ³ /1000 strokes	0	3,0
1.5 Start	250	35,0-36,0	cm ³ /1000 strokes	0	
1.6 Full-load speed regulation	2600	17,5-23,5	cm ³ /1000 strokes	1,050	
1.7 Load-dependent start of delivery	-				

2. Test Specifications

checking values in brackets ()

2.1 Timing device LDA=1,050	n = rev/min mm	500 (*)	750 1,1-1,9(0,8-2,2)	1000 (*)	1500 (3,8-5,2)	2300 7,4-8,2(7,1-8,5)
2.2 Supply pump LDA=1,050	n = rev/min bar (kgf/cm ²)	500 3,2-3,6			2300 8,1-8,5	
Overflow delivery	n = rev/min cm ³ /10 s	500 55-138(40-153)			2400 55-138(40-153)	

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2700	7,0-13,0 (6,0-14,0)	1,050
	2600	(16,5-24,5)	1,050
	2400	40,6-42,6 (39,4-43,8)	1,050
	1500	(39,1-43,5)	1,050
	** 750	34,5-35,5 (32,0-38,0)	0,250
	500	(25,5-31,5)	0
switch-off	2400	0	
Idle stop	400	(4,0-12,0)	
	475		
	100	26,5-36,5	
	400	31,5-41,5	
End stop	480	25,2-29,8	
2.4 Solenoid	max. cut-in voltage	xxx min. 10 V	
	test voltage	xxxxxxx rated voltage 12V.	

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	3,2-3,4
KF	6,3-6,6
MS	1,5-1,7
SVS	4,0
A	
B	

Observations
*operating
stroke (KSB)

Please note instruc-
tions on sheet 2
**Correction at the
adjusting nut. (46)

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* Test hydr. cold-start accelerator:

Apply 12 V to magnet of hydr. cold-start accelerator.

500 1/min 1.9 - 2.9 (1.7-3.1)

1000 1/min 3.7 - 4.7 (3.5-4.9)

** Manifold-pressure compensator stroke = 4.3 mm

Test Specifications Distributor-type Fuel-injection Pumps

VE 4/9 F 2075 R 126-2 Overflow temperature 45° C

0 460 494 155

Test pressure line

DHK: 1 688 901 022/130 bar

6x2x450 mm / 1 680 750 073

supersedes

company: Peugeot

engine: XD 3 S

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

see VDT-W-460/...

Pre-stroke setting

mm

1. Settings

	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1500	5,8- 6,2 mm	0,8	
1.2 Supply-pump pressure	1500	5,6- 6,2 bar (kgf/cm ²)	0,8	
1.3 Full-load delivery with charge-air pressure	500	42,8-43,8 cm ³ /1000 strokes	0	
Full-load delivery without charge-air pressure	1500	54,5-55,5 cm ³ /1000 strokes	0,8	2,5(3,0)
1.4 Idle regulation	350	20,0-24,0 cm ³ /1000 strokes	0	2,0(3,0)
1.5 Full-speed regulation	2300	25,0-31,0 cm ³ /1000 strokes	0,8	
1.6 Start	100	min. 57,0 cm ³ /1000 strokes	0	
1.7 Load-dependent port-closing	-			

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min	750	1000	1500	2000
LDA=0,8 bar	mm	0,8-1,6(0,5-1,9)	2,5-3,3(2,7-3,6)	(5,3-6,7)	7,8-8,6(7,5-8,9)
2.2 Supply pump	n = rev/min	200	750	2000	
LDA=0,8 bar	bar (kgf/cm ²)	1,4-2,0	3,4-4,0	7,1-7,7	
Overflow delivery	n = rev/min cm ³ /10 s	500			2075
		55-138(40-153)			55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2600	max. 1,0	0,8
	2300	(24,0-32,0)	0,8
	2200	38,0-44,0(37,0-45,0)	0,8
	2000	53,0-55,0(51,7-56,3)	0,8
	1500	(52,7-57,3)	0,8
	1000	52,0-55,0(50,5-56,5)	0,8
	750*	48,7-49,7(46,2-52,2)	0,25
	500	(40,3-46,3)	0
switch-off			
elektr.	400	0	
Idle stop	500	max. 1,0	
	400	8,0-12,0(6,0-14,0)	
	350	(18,0-26,0)	
End stop	230	min. 60	
	330	max. 60	
2.4 Solenoid	max. cut-in voltage	xxx min 22,0 V	
	test voltage	xxxxx rated voltage 12V.	

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	K1
KF	5,4- 5,7
MS	1,2- 1,4
SVS	4,6
A XK	20,2-22,2
B XL	19,3-12,6

Observations

Manifold-pressure
compensator stroke
= 4,5 mm
Correction at the
adjusting nut. (46)
Pulling electro-
magnet 24 V

Test Specifications Fuel Injection Pumps and Governors

40

WPP 001/4 MWM 1,5 c

6. Edition

En

PES 2 A 75 D..RS1235,1252,1298
3 80 ..RS1236,1239,1299
4 ..RS1237,1246,1276,1301
** 6 ..RS1238,1302

EP/RSV 300-1000 A7C505 R
A7B505DR
EP/RSV 325-1500 A2B505DR
A2C505 R

superseded
company
engine

4.83
MWM
D 208-
D 308-
D 225- 2..6
D 325-
D 226-
D 327-

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,2-2,3
(2,15-2,35) mm (from BDC)

Testoil-ISO 4113

Rotational speed rev/min	Control rod travel mm	Fuel delivery "C" and "D" cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery "C" and "D" cm ³ /100 strokes	Spring pre-tensioning (torque control valve) mm
1	2	3	4	2	3	6
1000	12	6,2 - 6,6	0,4	9	4,1-4,5	
200	9	3,2 - 3,7		6	1,2-2,0	
	9	2,1 - 2,8		9	2,7-3,7	

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

300 - 1000

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel rev/min				Control lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca.68	1000	16,0	without auxiliary spring			ca.25	300	7,0	-	-
	1050	8,5					100	min.19,5		
	1100	2,4					300	7,4-7,6		
ca.67	1030	8,0-9,0	with auxiliary spring				390-	450=2,0		
2a	1070	2,0-4,0								
	1120	0,3-1,0								

** As from FD 823 the idle auxiliary-spring has been changed from 1 424 641 000 to ... 001. New values enclosed.

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limit		3a Fuel delivery characteristics		Starting fuel delivery Idle		5 Idle stop	
Test oil temp 40°C (104°F)		Note changed to)							
rev/min	cm ³ /1000 strokes	rev/min		rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3		4	5	6	7	8	9
page	3 - 33 !								

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.84

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B. Governor Settings

325-1500

① Upper rated speed			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca. 58	1500	16,0	without auxiliary spring			ca. 16	325	7,0	-	-
	1580	9,0					100	min. 19,5		
	1630	4,2					325	7,4-7,6		
ca. 56	1530	8,0-9,0	with auxiliary spring				445	-505=2,0		
⑤	1580	3,0-4,0								
	1720	0,3-1,0								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

② Full-load stop		⑥ Rotational speed limit	③a Fuel delivery characteristics		Starting fuel delivery Idle		⑤a Idle stop	
Test oil temp 40°C (104°F)		Note changed to rev/min						
rev/min	cm ³ /1000 strokes	3	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2		4	5	6	7	8	9
page 3 - 33!			⑥a					

Checking values in brackets

* 1 mm less control rod travel than col 2

The rating plate described on MWM 1.5 a has recently been modified to enable more precise adjustment on governors with torque control. The modification was carried out in columns n = engine speed and Q = (full-load quantity). Testing was extended to two speeds and two quantities.

Deviating from the instructions WPP 001/4, 1. Supplement "Adjustment of the governor and the pump", the following points now apply:

- (2) Adjustment as per rating plate n = 1 (1st speed) and Q = (1st quantity; or according to columns 1 and 2.
- (3) Adjustment is carried out until the control-rod travel changes, as read under (2), or (with the new rating plate) until the 2nd quantity is reached at the second speed; or as per columns 4 and 5.
- (6) Is to be adjusted as per rating plate n = (1st speed + 20 min⁻¹); or as per column 3.

In the case of repairs to Fendt tractors on which the new rating plate has not yet been attached (2nd speed and 2nd quantity), the full-load data applies, listed as per engine types; in accordance with the above instructions.

With new replacement pumps delivered from the Stuttgart warehouse, the spring retainer is not fitted! Order from MWM Co using the old rating plate.

Full-load data for Fendt tractors - Engine D 208/308

Only valid for engines with pumps

PES 3 A 75 C 320/3 RS 1236 and 39
PES 4 A 75 C 320/3 RS 1237

Testoil-ISO 4113

C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational speed limitation	Fuel delivery characteristics		Starting fuel delivery idle switching point		Intermediate rotational speed Torque-control travel	
rev/min	cm ³ /1000 strokes		rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	

Fendt tractors - Output at speed - Engine and tractor type

32 PS / 2100 min⁻¹ - D 208 - 3 - Farmer 2 D -

1050 36,0 - 37,0 1070 700 39,0 - 41,0

32 PS / 1050 min⁻¹ - D 308 - 3 - 231 GT -

975 36,0 - 37,0 990 700 39,0 - 41,0

38 PS / 2600 min⁻¹ - D 208 - 3 - Farmer 2 -

1300 35,0 - 36,0 1320 700 36,0 - 38,0

55 PS / 2400 min⁻¹ - D 208 - 4 - Farmer 4 S -

1200 41,0 - 42,0 1220 700 42,0 - 44,0

General fitting - Output at speed

D 208 - 2

F 31 PS / 3000 min⁻¹

1500 41,5 - 43,5 1520

B 30 PS / 3000 min⁻¹

1500 39,5 - 41,5 1520

A 28 PS / 3000 min⁻¹

1500 41,5 - 43,5 1520

F 30 PS / 2800 min⁻¹

1400 41,5 - 43,5 1420

B 29 PS / 2800 min⁻¹

1400 40,0 - 42,0 1420

A 27 PS / 2800 min⁻¹

1400 41,5 - 43,5 1420

Testoil ISO 4113

C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational speed limitation	Fuel delivery characteristics		Starting fuel delivery Idle switching point		Intermediate rotational speed Torque-control travel	
rev/min	cm ³ /1000 strokes		rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	

F 29 PS / 2600 min⁻¹
1300 43,0 - 45,0 1320

B 28 PS / 2600 min⁻¹
1300 41,0 - 43,0 1320

A 26 PS / 2600 min⁻¹
1300 42,5 - 44,5 1320

F 28 PS / 2500 min⁻¹
1250 42,5 - 44,5 1270

B 27 PS / 2500 min⁻¹
1250 40,5 - 42,5 1270

A 25 PS / 2500 min⁻¹
1250 41,5 - 43,5 1270

F 27 PS / 2400 min⁻¹
1200 42,0 - 44,0 1220

B 26 PS / 2400 min⁻¹
1200 40,0 - 42,0 1220

A 24 PS / 2400 min⁻¹
1200 41,0 - 43,0 1220

F 26 PS / 2300 min⁻¹
1150 41,5 - 43,5 1170

B 25 PS / 2300 min⁻¹
1150 39,5 - 41,5 1170

A 23 PS / 2300 min⁻¹
1150 40,5 - 42,5 1170

Testoil-ISO 4113

C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational speed limitation	Fuel delivery characteristics		Starting fuel delivery idle switching point		Intermediate rotational speed Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	

F 25 PS / 2200 min⁻¹

1100 41,0 - 43,0 1120

B 24 PS / 2200 min⁻¹

1100 39,0 - 41,0 1120

A 22 PS / 2200 min⁻¹

1100 40,0 - 42,0 1120

F 24 PS / 2100 min⁻¹

1050 40,5 - 42,5 1060

B 23 PS / 2100 min⁻¹

1050 38,0 - 40,0 1060

A 21 PS / 2100 min⁻¹

1050 39,0 - 41,0 1060

F 23 PS / 2000 min⁻¹

1000 39,0 - 41,0 1010

B 22 PS / 2000 min⁻¹

1000 37,0 - 39,0 1010

A 20 PS / 2000 min⁻¹

1000 38,0 - 40,0 1010

B 20 PS / 1800 min⁻¹

900 36,0 - 38,0 910

A 18 PS / 1800 min⁻¹

900 36,5 - 38,5 910

B 16 PS / 1500 min⁻¹

750 34,0 - 36,0 760

TestoH30 4113

Checking values in brackets

* 1 mm less control rod travel than col 2

C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational-speed limitation	Fuel delivery characteristics		Starting fuel delivery idle switching point		Intermediate rotational speed Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	

A 15 PS / 1500 min⁻¹

750 36,0 - 38,0 760

Testoil-ISO 4113

C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational-speed limitation	Fuel delivery characteristics		Starting fuel delivery idle switching point		Intermediate rotational speed Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	

F 46,5 PS / 3000 min⁻¹

1500 42,0 - 44,0 1520

B 45 PS / 3000 min⁻¹

1500 39,0 - 41,0 1520

A 42 PS / 3000 min⁻¹

1500 40,5 - 42,5 1520

F 45 PS / 2800 min⁻¹

1400 42,0 - 44,0 1420

B 43,5 PS / 2800 min⁻¹

1400 39,0 - 41,0 1420

A 40,5 PS / 2800 min⁻¹

1400 40,0 - 42,0 1420

F 43,5 PS / 2600 min⁻¹

1300 41,5 - 43,5 1320

B 42 PS / 2600 min⁻¹

1300 39,5 - 41,5 1320

A 39 PS / 2600 min⁻¹

1300 40,0 - 42,0 1320

F 42 PS / 2500 min⁻¹

1250 40,5 - 42,5 1270

B 40,5 PS / 2500 min⁻¹

1250 38,5 - 40,5 1270

A 37,5 PS / 2500 min⁻¹

1250 39,5 - 41,5 1270

Testoil ISO 4113

C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational-speed limitation	Fuel delivery characteristics		Starting fuel delivery Idle switching point		Intermediate rotational speed Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	

F 40,5 PS / 2400 min⁻¹

1200 40,5 - 42,5 1220

B 39 PS / 2400 min⁻¹

1200 38,5 - 40,5 1220

A 36 PS / 2400 min⁻¹

1200 39,5 - 41,5 1220

F 39 PS / 2300 min⁻¹

1150 39,5 - 41,5 1170

B 37,5 PS / 2300 min⁻¹

1150 38,0 - 40,0 1170

A 34,5 PS / 2300 min⁻¹

1150 38,0 - 40,0 1170

F 37,5 PS / 2200 min⁻¹

1100 38,5 - 40,5 1120

B 36 PS / 2200 min⁻¹

1100 36,5 - 38,5 1120

A 33 PS / 2200 min⁻¹

1100 38,0 - 40,0 1120

F 36 PS / 2100 min⁻¹

1050 38,0 - 40,0 1060

B 34,5 PS / 2100 min⁻¹

1050 36,0 - 38,0 1060

A 31,5 PS / 2100 min⁻¹

1050 36,0 - 38,0 1060

Testoil ISO 4113

C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational-speed limitation	Fuel delivery characteristics		Starting fuel delivery Idle switching point		Intermediate rotational speed Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	

F 34,5 PS / 2000 min⁻¹

1000 37,0 - 39,0 1010

B 33 PS / 2000 min⁻¹

1000 35,5 - 37,5 1010

A 30 PS / 2000 min⁻¹

1000 37,0 - 39,0 1010

3 30 PS / 1800 min⁻¹

900 34,0 - 36,0 910

A 27 PS / 1800 min⁻¹

900 35,0 - 37,0 910

B 24 PS / 1500 min⁻¹

750 33,0 - 35,0 760

A 22,5 PS / 1500 min⁻¹

750 36,0 - 38,0 760

Testoil-ISO 4113

C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation	Fuel delivery characteristics		Starting fuel delivery Idle switching point		Intermediate rotational speed Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	

F 62 PS / 3000 min⁻¹
1500 40,5 - 42,5 1520

B 60 PS / 3000 min⁻¹
1500 39,0 - 41,0 1520

A 56 PS / 3000 min⁻¹
1500 40,0 - 42,0 1520

F 60 PS / 2800 min⁻¹
1400 40,0 - 42,0 1420

B 58 PS / 2800 min⁻¹
1400 35,5 - 37,5 1420

A 54 PS / 2800 min⁻¹
1400 40,0 - 42,0 1420

F 53 PS / 2600 min⁻¹
1300 40,0 - 42,0 1320

B 56 PS / 2600 min⁻¹
1300 38,0 - 40,0 1320

A 52 PS / 2600 min⁻¹
1300 39,0 - 41,0 1320

F 56 PS / 2500 min⁻¹
1250 39,0 - 41,0 1270

B 54 PS / 2500 min⁻¹
1250 37,5 - 39,5 1270

A 50 PS / 2500 min⁻¹
1250 39,0 - 41,0 1270

Testoil 30 4113

C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational speed limitation	Fuel delivery characteristics		Starting fuel delivery idle switching point		Intermediate rotational speed Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	

F 54 PS / 2400 min⁻¹
1200 39,0 - 41,0 1220

B 52 PS / 2400 min⁻¹
1200 37,5 - 39,5 1220

A 48 PS / 2400 min⁻¹
1200 38,0 - 40,0 1220

F 52 PS / 2300 min⁻¹
1150 38,0 - 40,0 1170

B 50 PS / 2300 min⁻¹
1150 36,5 - 38,5 1170

A 46 PS / 2300 min⁻¹
1150 37,5 - 39,5 1170

F 50 PS / 2200 min⁻¹
1100 39,0 - 41,0 1120

B 48 PS / 2200 min⁻¹
1100 37,0 - 39,0 1120

A 44 PS / 2200 min⁻¹
1100 38,0 - 40,0 1120

F 48 PS / 2100 min⁻¹
1050 37,5 - 39,5 1060

B 46 PS / 2100 min⁻¹
1050 35,5 - 37,5 1060

A 42 PS / 2100 min⁻¹
1050 36,0 - 38,0 1060

Testoil-ISO 4113

Checking values in brackets

* 1 mm less control rod travel than col 2

C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational-speed limitation	Fuel delivery characteristics		Starting fuel delivery idle switching point		Intermediate rotational speed Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	

F 46 PS / 2000 min⁻¹
1000 38,0 - 40,0 1010

B 44 PS / 2000 min⁻¹
1000 35,5 - 37,5 1010

A 40 PS / 2000 min⁻¹
1000 36,0 - 38,0 1010

B 40 PS / 1800 min⁻¹
900 34,5 - 36,5 910

A 36 PS / 1800 min⁻¹
900 34,0 - 36,0 910

B 32 PS / 1500 min⁻¹
750 30,5 - 32,5 760

A 30 PS / 1500 min⁻¹
750 33,0 - 35,0 760

Testoil-ISO 4113

C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational speed limitation	Fuel delivery characteristics		Starting fuel delivery idle switching point		Intermediate rotational speed Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	

F 93 PS / 3000 min⁻¹
1500 39,5 - 41,5 1520

B 90 PS / 3000 min⁻¹
1500 38,0 - 40,0 1520

A 84 PS / 3000 min⁻¹
1500 39,0 - 41,0 1520

F 90 PS / 2800 min⁻¹
1400 39,5 - 41,5 1420

B 37 PS / 2800 min⁻¹
1400 38,0 - 40,0 1420

A 81 PS / 2800 min⁻¹
1400 39,0 - 41,0 1420

F 87 PS / 2600 min⁻¹
1300 39,5 - 41,5 1320

B 34 PS / 2600 min⁻¹
1300 38,0 - 40,0 1320

A 78 PS / 2600 min⁻¹
1300 38,5 - 40,5 1320

F 84 PS / 2500 min⁻¹
1250 39,0 - 41,0 1270

B 81 PS / 2500 min⁻¹
1250 37,0 - 39,0 1270

A 75 PS / 2500 min⁻¹
1250 38,0 - 40,0 1270

Testoil ISO 4113

C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational-speed limitation	Fuel delivery characteristics		Starting fuel delivery idle switching point		Intermediate rotational speed Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	

F 81 PS / 2400 min⁻¹
1200 38,0 - 40,0 1220

B 78 PS / 2400 min⁻¹
1200 36,5 - 38,5 1220

A 72 PS / 2400 min⁻¹
1200 38,0 - 40,0 1220

F 78 PS / 2300 min⁻¹
1150 38,0 - 40,0 1170

B 75 PS / 2300 min⁻¹
1150 36,5 - 38,5 1170

A 69 PS / 2300 min⁻¹
1150 37,0 - 39,0 1170

F 75 PS / 2200 min⁻¹
1100 38,0 - 40,0 1120

B 72 PS / 2200 min⁻¹
1100 36,0 - 38,0 1120

A 66 PS / 2200 min⁻¹
1100 37,0 - 39,0 1120

F 72 PS / 2100 min⁻¹
1050 37,0 - 39,0 1060

B 69 PS / 2100 min⁻¹
1050 35,5 - 37,5 1060

A 63 PS / 2100 min⁻¹
1050 36,0 - 38,0 1060

Testoil 100 4113

Checking values in brackets

* 1 mm less control rod travel than col 2

C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational-speed limitation	Fuel delivery characteristics		Starting fuel delivery idle switching point		Intermediate rotational speed Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	

F 69 PS / 2000 min⁻¹
1000 36,5 - 38,5 1010

B 66 PS / 2000 min⁻¹
1000 34,5 - 36,5 1010

A 60 PS / 2000 min⁻¹
1000 35,0 - 37,0 1010

B 60 PS / 1800 min⁻¹
900 33,5 - 35,5 910

A 54 PS / 1800 min⁻¹
900 34,0 - 36,0 910

B 48 PS / 1500 min⁻¹
750 31,0 - 33,0 760

A 45 PS / 1500 min⁻¹
750 33,0 - 35,0 760

Testoil ISO 4113

C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational-speed limitation	Fuel delivery characteristics		Starting fuel delivery Idle switching point		Intermediate rotational speed Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8.	

B 35,5 PS / 3000 min⁻¹

1500 55,0 - 57,0 1520 800 52,5 - 55,5

A 32 PS / 3000 min⁻¹

1500 51,0 - 53,0 1520

F 41 PS / 2800 min⁻¹

1400 66,5 - 68,5 1420 800 55,5 - 58,5

F 38,5 PS / 2500 min⁻¹

1250 62,5 - 64,5 1270 800 55,5 - 58,5

B 37 PS / 2500 min⁻¹

1250 59,5 - 61,5 1270 800 52,5 - 55,5

A 34 PS / 2500 min⁻¹

1250 55,5 - 57,5 1270

F 36,5 PS / 2300 min⁻¹

1150 60,5 - 62,5 1170 800 55,5 - 58,5

B 35 PS / 2300 min⁻¹

1150 58,5 - 60,5 1170 800 52,5 - 55,5

A 32 PS / 2300 min⁻¹

1150 53,0 - 55,0 1170

F 33 PS / 2000 min⁻¹

1000 58,5 - 60,5 1010 750 55,0 - 58,0

B 31 PS / 2000 min⁻¹

1000 55,0 - 57,0 1010 750 52,5 - 55,5

A 28,5 PS / 2000 min⁻¹

1000 50,0 - 52,0 1010

Testoil ISO 4113

Checking values in brackets

* 1 mm less control rod travel than col. 2

C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational-speed limitation	Fuel delivery characteristics		Starting fuel delivery Idle switching point		Intermediate rotational speed Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	

B 28,5 PS / 1800 min⁻¹

900	52,5 - 54,5	910	750	52,0 - 55,0
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A 26 PS / 1800 min⁻¹

900	48,0 - 50,0	910
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B 24 PS / 1500 min⁻¹

750	46,5 - 48,5	760	750	50,5 - 53,5
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A 22 PS / 1500 min⁻¹

750	51,0 - 53,0	760
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Testoil-ISO 4113

C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational speed limitation	Fuel delivery characteristics		Starting fuel delivery Idle switching point		Intermediate rotational speed Torque-control travel	
rev/min	cm ³ /1000 strokes		rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	

B 53 PS / 3000 min⁻¹

1500 54,5 - 56,5 1520 800 51,0 - 54,0

A 48 PS / 3000 min⁻¹

1500 50,5 - 52,5 1520

F 62 PS / 2800 min⁻¹

1400 66,5 - 68,5 1420 800 54,0 - 57,0

F 53 PS / 2500 min⁻¹

1250 62,5 - 64,5 1270 800 54,0 - 57,0

B 56 PS / 2500 min⁻¹

1250 59,5 - 61,5 1270 800 51,0 - 54,0

A 51 PS / 2500 min⁻¹

1250 54,5 - 56,5 1270

F 55 PS / 2300 min⁻¹

1150 58,5 - 60,5 1170 800 54,0 - 57,0

B 53 PS / 2300 min⁻¹

1150 57,5 - 59,5 1170 800 51,0 - 54,0

A 48 PS / 2300 min⁻¹

1150 51,5 - 53,5 1170

F 49,5 PS / 2000 min⁻¹

1000 57,5 - 59,5 1010 750 54,0 - 57,0

B 46,5 PS / 2000 min⁻¹

1000 53,5 - 55,5 1010 750 51,0 - 54,0

A 43 PS / 2000 min⁻¹

1000 48,5 - 50,5 1010

Testoil-ISO 4113

C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational-speed limitation	Fuel delivery characteristics		Starting fuel delivery idle switching point		Intermediate rotational speed Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	

B 43 PS / 1800 min⁻¹

900 52,5 - 54,5 910 750 52,0 - 55,0

A 39 PS / 1800 min⁻¹

900 47,5 - 49,5 910

B 36 PS / 1500 min⁻¹

750 49,5 - 51,5 760 650 49,0 - 52,0

A 33 PS / 1500 min⁻¹

750 45,5 - 47,5 760

Test to ISO 4113

C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational speed limitation	Fuel delivery characteristics		Starting fuel delivery Idle switching point		Intermediate rotational speed Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	

B 71 PS / 3000 min⁻¹

1500 54,5 - 56,5 1520 800 62,0 - 65,0

A 64 PS / 3000 min⁻¹

1500 49,5 - 51,5 1520

F 83 PS / 2800 min⁻¹

1400 65,5 - 67,5 1420 800 63,0 - 66,0

F 78 PS / 2500 min⁻¹

1250 61,5 - 63,5 1270 800 50,0 - 53,0

B 74,5 PS / 2500 min⁻¹

1250 58,5 - 60,5 1270 800 50,0 - 53,0

A 68 PS / 2500 min⁻¹

1250 53,5 - 55,5 1270

F 73 PS / 2300 min⁻¹

1150 60,5 - 62,5 1170 800 52,0 - 55,0

B 71 PS / 2300 min⁻¹

1150 58,5 - 60,5 1170 800 50,0 - 53,0

A 64 PS / 2300 min⁻¹

1150 51,5 - 53,5 1170

F 66 PS / 2000 min⁻¹

1000 57,5 - 59,5 1010 750 52,0 - 55,0

B 62,5 PS / 2000 min⁻¹

1000 53,5 - 55,5 1010 750 50,0 - 53,0

A 57 PS / 2000 min⁻¹

1000 48,5 - 50,5 1010

Testoil-ISO 4113

C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational speed limitation	Fuel delivery characteristics		Starting fuel delivery Idle switching point:		Intermediate rotational speed Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	

B 57 PS / 1800 min⁻¹

900 51,5 - 53,5 910 750 49,0 - 52,0

A 52 PS / 1800 min⁻¹

900 45,5 - 47,5 910

B 48 PS / 1500 min⁻¹

750 48,5 - 50,5 760 650 47,0 - 50,0

A 44 PS / 1500 min⁻¹

750 45,5 - 47,5 760

Testoil HSO 4113

C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational speed limitation	Fuel delivery characteristics		Starting fuel delivery idle switching point		Intermediate rotational speed Torque-control travel	
rev/min	cm ³ /1000 strokes		rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	

B 106 PS / 3000 min⁻¹

1500 55,5 - 57,5 1520 800 50,0 - 53,0

A 96 PS / 3000 min⁻¹

1500 49,5 - 51,5 1520

F 125 PS / 2800 min⁻¹

1400 66,5 - 68,5 1420 800 54,0 - 57,0

F 117 PS / 2500 min⁻¹

1250 61,5 - 63,5 1270 800 54,0 - 57,0

B 112 PS / 2500 min⁻¹

1250 58,5 - 60,5 1270 800 50,0 - 53,0

A 102 PS / 2500 min⁻¹

1250 53,5 - 55,5 1270

F 110 PS / 2300 min⁻¹

1150 59,5 - 61,5 1170 800 54,0 - 57,0

B 106 PS / 2300 min⁻¹

1150 56,5 - 58,5 1170 800 50,0 - 53,0

A 96 PS / 2300 min⁻¹

1150 51,5 - 53,5 1170

F 99 PS / 2000 min⁻¹

1000 56,5 - 58,5 1010 750 54,0 - 57,0

B 94 PS / 2000 min⁻¹

1000 53,5 - 55,5 1010 750 50,0 - 53,0

A 86 PS / 2000 min⁻¹

1000 47,5 - 49,5 1010

Testoil-ISO 4113

C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational-speed limitation	Fuel delivery characteristics		Starting fuel delivery idle switching point		Intermediate rotational speed Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	

B 86 PS / 1800 min⁻¹

900 49,5 - 51,5 910 750 53,0 - 56,0

A 78 PS / 1800 min⁻¹

900 46,5 - 48,5 910

B 72 PS / 1500 min⁻¹

750 49,5 - 51,5 760 650 47,0 - 50,0

A 56 PS / 1500 min⁻¹

750 45,5 - 47,5 760

Testoil-ISO 4113

C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational-speed limitation	Fuel delivery characteristics		Starting fuel delivery Idle switching point		Intermediate rotational speed Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	

F 33 PS / 2800 min⁻¹

1400 51,5 - 53,5 1420 800 46,0 - 49,0

F 32 PS / 2500 min⁻¹

1250 52,5 - 54,5 1270 800 46,0 - 49,0

B 31 PS / 2500 min⁻¹

1250 49,5 - 51,5 1270 800 44,0 - 47,0

A 28 PS / 2500 min⁻¹

1250 49,5 - 51,5 1270

F 30 PS / 2300 min⁻¹

1150 48,5 - 50,5 1170 800 46,0 - 49,0

B 28,5 PS / 2300 min⁻¹

1150 45,5 - 47,5 1170 800 44,0 - 47,0

A 26 PS / 2300 min⁻¹

1150 45,5 - 47,5 1170

F 26 PS / 2000 min⁻¹

1000 43,5 - 45,5 1010 800 46,0 - 49,0

B 25 PS / 2000 min⁻¹

1000 41,5 - 43,5 1010 800 44,0 - 47,0

A 23 PS / 2000 min⁻¹

1000 41,5 - 43,5 1010

A 21 PS / 1800 min⁻¹

900 41,5 - 43,5 910

A 17 PS / 1500 min⁻¹

750 39,5 - 41,5 760

Testoil-ISO 4113

C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational speed limitation	Fuel delivery characteristics		Starting fuel delivery idle switching point		Intermediate rotational speed Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	

F 50 PS / 2800 min⁻¹

1400 48,5 - 50,5 1420 800 46,0 - 49,0

F 48,5 PS / 2500 min⁻¹

1250 50,5 - 52,5 1270 800 46,0 - 49,0

B 46,5 PS / 2500 min⁻¹

1250 47,5 - 49,5 1270 800 43,0 - 46,0

A 42 PS / 2500 min⁻¹

1250 47,5 - 49,5 1270

F 46 PS / 2300 min⁻¹

1150 47,5 - 49,5 1170 800 46,0 - 49,0

B 44 PS / 2300 min⁻¹

1150 45,5 - 47,5 1170 800 43,0 - 46,0

A 40 PS / 2300 min⁻¹

1150 45,5 - 47,5 1170

F 40 PS / 2000 min⁻¹

1000 44,5 - 46,5 1010 800 46,0 - 49,0

B 38,5 PS / 2000 min⁻¹

1000 42,5 - 44,5 1010 800 43,0 - 46,0

A 35 PS / 2000 min⁻¹

1000 42,5 - 44,5 1010

A 31,5 PS / 1800 min⁻¹

900 40,5 - 42,5 910

A 26 PS / 1500 min⁻¹

750 39,5 - 41,5 760

Testoil ISO 4113

C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational speed limitation	Fuel delivery characteristics		Starting fuel delivery idle switching point		Intermediate rotational speed Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	

F 68 PS / 2800 min⁻¹

1400 49,5 - 51,5 1420 800 46,0 - 49,0

F 66 PS / 2500 min⁻¹

1250 50,5 - 52,5 1270 800 46,0 - 49,0

B 63 PS / 2500 min⁻¹

1250 47,5 - 49,5 1270 800 44,0 - 47,0

A 57,5 PS / 2500 min⁻¹

1250 47,5 - 49,5 1270

F 61 PS / 2300 min⁻¹

1150 47,5 - 49,5 1170 800 46,0 - 49,0

B 58,5 PS / 2300 min⁻¹

1150 45,5 - 47,5 1170 800 44,0 - 47,0

A 53,5 PS / 2300 min⁻¹

1150 45,5 - 47,5 1170

F 53 PS / 2000 min⁻¹

1000 43,5 - 45,5 1010 800 46,0 - 49,0

B 51 PS / 2000 min⁻¹

1000 41,5 - 43,5 1010 800 44,0 - 47,0

A 46,5 PS / 2000 min⁻¹

1000 41,5 - 43,5 1010

A 42 PS / 1800 min⁻¹

900 40,5 - 42,5 910

A 35 PS / 1500 min⁻¹

750 39,5 - 41,5 760

Testoil ISO 4113

C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational-speed limitation	Fuel delivery characteristics		Starting fuel delivery Idle switching point		Intermediate rotational speed Torque-control travel	
rev/min	cm ³ /1000 strokes		rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	

F 102 PS / 2800 min⁻¹

1400 49,5 - 51,5 1420 800 46,0 - 49,0

F 99 PS / 2500 min⁻¹

1250 50,5 - 52,5 1270 800 46,0 - 49,0

B 95 PS / 2500 min⁻¹

1250 47,5 - 49,5 1270 800 44,0 - 47,0

A 86 PS / 2500 min⁻¹

1250 47,5 - 49,5 1270

F 92 PS / 2300 min⁻¹

1150 47,5 - 49,5 1170 800 46,0 - 49,0

B 88 PS / 2300 min⁻¹

1150 45,5 - 47,5 1170 800 44,0 - 47,0

A 80 PS / 2300 min⁻¹

1150 45,5 - 47,5 1170

F 80 PS / 2000 min⁻¹

1000 43,5 - 45,5 1010 800 46,0 - 49,0

B 77 PS / 2000 min⁻¹

1000 41,5 - 43,5 1010 800 44,0 - 47,0

A 70 PS / 2000 min⁻¹

1000 41,5 - 43,5 1010

A 63 PS / 1800 min⁻¹

900 40,5 - 42,5 910

A 52,5 PS / 1500 min⁻¹

750 39,5 - 41,5 760

Testoil-BO 4113

Checking values in brackets

* 1 mm less control rod travel than col. 2

C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational speed limitation	Fuel delivery characteristics		Starting fuel delivery idle switching point		Intermediate rotational speed Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	

B 48 PS / 3000 min⁻¹

1500 47,0 - 49,0 1520 800 49,5 - 52,5

A 43,5 PS / 3000 min⁻¹

1500 44,0 - 46,0 1520

F 55 PS / 2800 min⁻¹

1400 53,5 - 55,5 1420 800 52,5 - 55,5

F 53 PS / 2500 min⁻¹

1250 55,5 - 57,5 1270 800 52,5 - 55,5

B 50 PS / 2500 min⁻¹

1250 52,5 - 54,5 1270 800 49,5 - 52,5

A 46,5 PS / 2500 min⁻¹

1250 48,0 - 50,0 1270

F 50 PS / 2300 min⁻¹

1150 56,0 - 58,0 1170 800 51,0 - 54,0

B 48,5 PS / 2300 min⁻¹

1150 51,5 - 53,5 1170 800 49,5 - 52,5

A 44 PS / 2300 min⁻¹

1150 47,0 - 49,0 1170

F 46 PS / 2000 min⁻¹

1000 54,0 - 56,0 1010 750 52,5 - 55,5

B 44 PS / 2000 min⁻¹

1000 50,5 - 52,5 1010 750 50,0 - 53,0

A 40 PS / 2000 min⁻¹

1000 46,0 - 48,0 1010

Testoil-ISO 4113

C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational speed limitation	Fuel delivery characteristics		Starting fuel delivery idle switching point		Intermediate rotational speed Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	

B 40 PS / 1800 min⁻¹

900 49,5 - 51,5 910 750 50,0 - 53,0

A 36,5 PS / 1800 min⁻¹

900 45,0 - 47,0 910

B 33,5 PS / 1500 min⁻¹

750 47,5 - 49,5 760

A 30,5 PS / 1500 min⁻¹

750 43,5 - 45,5 760

Testoil-ISO 4113

C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational speed limitation	Fuel delivery characteristics		Starting fuel delivery idle switching point		Intermediate rotational speed Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	

B 64 PS / 3000 min⁻¹

1500 47,5 - 49,5 1520 800 49,0 - 52,0

A 58 PS / 3000 min⁻¹

1500 44,0 - 46,0 1520

F 74 PS / 2800 min⁻¹

1400 53,5 - 55,5 1420 800 52,0 - 55,0

F 70,5 PS / 2500 min⁻¹

1250 52,5 - 54,5 1270 800 52,0 - 55,0

B 67 PS / 2500 min⁻¹

1250 49,0 - 51,0 1270 800 49,0 - 52,0

A 61 PS / 2500 min⁻¹

1250 44,5 - 46,5 1270

F 67 PS / 2300 min⁻¹

1150 51,5 - 53,5 1170 800 52,0 - 55,0

B 64,5 PS / 2300 min⁻¹

1150 49,0 - 51,0 1170 800 49,0 - 52,0

A 58,5 PS / 2300 min⁻¹

1150 44,5 - 46,5 1170

F 61 PS / 2000 min⁻¹

1000 50,0 - 52,0 1010 750 49,5 - 52,5

B 58,5 PS / 2000 min⁻¹

1000 48,0 - 50,0 1010 750 49,5 - 52,5

A 53 PS / 2000 min⁻¹

1000 44,0 - 46,0 1010

Testoil ISO 4113

C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational speed limitation	Fuel delivery characteristics		Starting fuel delivery idle switching point		Intermediate rotational speed Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	

B 53 PS / 1800 min⁻¹

900 47,0 - 49,0 910 750 49,5 - 52,5

A 49 PS / 1800 min⁻¹

900 43,0 - 45,0 910

B 44,5 PS / 1500 min⁻¹

750 47,0 - 49,0 760

A 41 PS / 1500 min⁻¹

760 43,0 - 45,0 760

Testoil-ISO 4113

C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational speed limitation	Fuel delivery characteristics		Starting fuel delivery idle switching point		Intermediate rotational speed Torque-control travel	
rev/min	cm ³ /1000 strokes		rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	

B 96 PS / 3000 min⁻¹

1500 51,5 - 53,5 1520 800 50,0 - 53,0

A 87 PS / 3000 min⁻¹

1500 47,5 - 49,5 1520

F 112 PS / 2800 min⁻¹

1400 58,0 - 60,0 1420 800 53,0 - 56,0

F 106 PS / 2500 min⁻¹

1250 57,5 - 59,5 1270 800 53,0 - 56,0

B 101 PS / 2500 min⁻¹

1250 54,0 - 56,0 1270 800 50,0 - 53,0

A 92 PS / 2500 min⁻¹

1250 49,0 - 51,0 1270

F 101 PS / 2300 min⁻¹

1150 57,5 - 59,5 1170 800 53,0 - 56,0

B 97 PS / 2300 min⁻¹

1150 55,0 - 57,0 1170 800 50,0 - 53,0

A 88 PS / 2300 min⁻¹

1150 50,0 - 52,0 1170

F 92 PS / 2000 min⁻¹

1000 52,5 - 54,5 1010 750 50,0 - 53,0

B 88 PS / 2000 min⁻¹

1000 50,0 - 52,0 1010 750 50,0 - 53,0

A 80 PS / 2000 min⁻¹

1000 45,5 - 47,5 1010

Testoil ISO 4113

C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational-speed limitation	Fuel delivery characteristics		Starting fuel delivery Idle switching point		Intermediate rotational speed Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	

B 80 PS / 1800 min⁻¹

900 50,0 - 52,0 910 750 50,0 - 53,0

A 73 PS / 1800 min⁻¹

900 45,5 - 47,5 910

B 67 PS / 1500 min⁻¹

750 50,0 - 52,0 760 650 52,0 - 55,0

A 61 PS / 1500 min⁻¹

750 45,5 - 47,5 760

Testoil ISO 4113

Test Specifications Fuel Injection Pumps 1A and Governors

40

WPP 001/4 HOR 1,3 c

2. Edition

En

PES 2 A 65 D 410/3 RS 1273
Komb.-Nr. 0 400 462 049

RSV 400-1225 A 1 B 1091 DL
A 1 C 1091 DL

superseded 12.77
company Holder
engine VD 2

1 - 2

0 -90° + 0,5° (+ 0,75°)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,9 - 2,0
(1,85-2,05) mm (from BQCRW = 4,5 - 7,5 mm)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1225	10,8+0,1	4,0-4,1	0,2 (0,3)			
400	7,7-7,9	1,0-1,6	0,2 (0,3)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
loose	800	0,3-1,0	-	-	-	ca. 26	400	7,3	1225	10,8-10,9
	x =	4,75					100	min. 19,0	1000	11,1-11,3
ca. 66	9,8	1265-1275					400	7,7 - 7,9	500	11,4-11,5
2a	4,0	1295-1325					560 - 620	= 2,0		
	1450	0,3-1,7					700	max. 1,0		

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limit		3a Fuel delivery characteristics		Starting fuel delivery Idle		4a Idle stop	
Test oil temp 40°C (104°F)		Note changed to)							
rev/min	cm ³ /1000 strokes	rev/min		rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3		4	5	6	7	8	9
1225	40,0 - 41,0 (39,0 - 42,0)	1265-1275*		1000	39,5-41,5 (38,5-42,5)	100	66,0-76,0 (63,0-79,0)	400	7,8
				500	37,0-39,0 (35,5-40,5)		= 19,5 - 21,0 mm RW		

Checking values in brackets

* 1 mm less control rod travel than col 2

3.84

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Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 HOR 2,0 a 1

1. Edition

En

PES 3 A 65 D 410/3 RS 1274 EP/RSV 400-1225 A1B 1042L
Komb.-Nr. 0 400 463 117

supersedes
company Holder
engine VD 3

1 - 2 - 3 je $120^\circ \pm 0,5^\circ (\pm 0,75^\circ)$

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $1,9 - 2,0$ mm (from BDC) RW = 6,0 mm
 $(1,85 - 2,05)$

Testoil-ISO 4113

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1225	10,8±0,1	4,2 - 4,3	0,2 (0,3)			
400	7,7-7,9	1,0 - 1,6	0,2 (0,3)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
loose	800	0,3-1,0	-	-	-	ca. 24	400	5,8	-	-
	x =						100	min. 19,0		
ca. 64	9,8	1265-1275					400	6,2 - 6,4		
2a	4,0	1295-1325					539-590	= 2,0		
	1450	0,3-1,7					700	max. 1,0		

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limit		3a Fuel delivery characteristics		Starting fuel delivery Idle		4a Idle stop	
Test oil temp 40°C (104°F)		Note: changed to 1 rev/min							
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	
1225	42,0 - 43,0 (41,0 - 44,0)	1265-1275*	-	-	100	55,0-70,0 = 19,0 - 21,0 mm RW	-	-	-

Checking values in brackets

* 1 mm less control rod travel than col 2
3.84

G12

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Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 EIC 5,9 b

3. Edition

En

Testoil-ISO 4113

PES 6 A 80 D 320 RS 1280 RSV 300-1150 AOB 2001 DR

Komb.-Nr. 0 400 476 071

1 - 5 - 3 - 6 - 2 - 4 je 60°

supersedes 12.81

company Eicher

engine EDK 6-4 Saugmotor
77 kW (105 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (2,10-2,30) mm (from BDC)
2,15-2,25

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1130	8,9-9,0	5,1 - 5,2	0,2(0,35)			
300	6,1-6,3	0,7 - 1,3	0,2 (0,3)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
loose	800	0,3-1,0	-	-	-	ca. 29	300	5,7	1130	8,9-9,0
	X =	6,0					100	min.19,5	795	9,2-9,4
							300	6,1-6,3	500	9,5-9,6
ca. 53	1170-1180	7,9					420-480	2,0		
⑤	1215-1245	4,0					650	max. 1,0		
	1380	0,3-1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

② Full-load stop		⑥ Rotational-speed limitat. Note: changed to ... rev/min	③a Fuel delivery characteristics		Starting fuel delivery Idle		⑤a Idle stop	
Test oil temp. 40°C (104°F)			rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
rev/min	cm ³ /1000 strokes	3	4	5	6	7	8	9
1	2							
1130	51,5 - 52,5 (50,0 - 54,0)	170-1180*	900	48,5 - 51,5 (47,0 - 53,0)	100	16,3-16,9 mm RW	300	6,2
			500	46,5 - 48,5 (45,0 - 50,0)				

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.84

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Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 HOR 2,9 b

2. Edition

Testoil-ISO 4113

PES 3 A 80 D 410/3 RS1313 EP/RSV 400-1250 A0 B 1123 L

A O C 1123 L

supersede 2.82

company Holder

engine VD 310-8

36 kW

Komb.-Nr. 0 400 463 136

1 - 2 - 3

0 - 120 - 240° ± 0,5° (± 0,75°)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,70-1,80
(1,65-1,85)

mm (from BDC)

Port closing difference between control-rod travel 9 and max. 9,0-9,9°

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1250	9,4-9,5	5,6 - 5,7	0,2(0,35)			
400	6,4-6,6	0,9 - 1,5	0,2(0,3)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control-lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0 x = 4,0	-	-	-	ca. 20	400	6,3	-	-
ca. 49	8,4	1290-1300					100	min. 19,5		
2a	4,0	1315-1345					400	6,7-6,9		
	1500	0,3-1,7					510-570	= 2,0		

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational speed limit		3a Fuel delivery characteristics		Starting fuel delivery idle		4a Idle stop	
Test oil temp. 40°C (104°F)		Note changed to rev/min		rev/min		rev/min		rev/min	
rev/min 1	cm ³ /1000 strokes 2	3	4	5	6	7	8	9	Control rod travel mm 9
1250	56,5 - 57,5 (55,0 - 59,0)	1290-1300*	-	-	-	-	-	-	-

Checking values in brackets

* 1 mm less control rod travel than col 2

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3.84

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 MAN 9,7 o2

1. Edition

En

PES 6 A 95 D 410 RS 2108

EP/RSV 250-1100 A 1 B 692 D

supersedes

company MAN

engine D 2156 HM 6 HKD

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (1,65-1,85) mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	9,0	7,5-8,0	0,5			
200	6,0 6,0	3,2-4,2 0,5-1,4				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca. 59	1100 1150 1200	16,0 11,5 6,3	without auxiliary spring			ca. 23	250	7,5	1080	0
	1160	9,0-12,0					100	19 - 21	900	0,2 - 0,4
	1200	4,6- 7,9	with auxiliary spring				250	7,2- 7,8	500	0,4 - 0,6
2a	1350	0,3- 1,0					400	3,5- 5,3		
							650	0 - 1,0		

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limit		3a Fuel delivery characteristics		Starting fuel delivery 5		4a Idle stop	
Test oil temp 40°C (104°F)		Note changed to				Idle			
rev/min	cm ³ /1000 strokes	rev/min		rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3		4	5	6	7	8	9
1100	110,0 - 112,0 (109,0 - 113,0)	1140-1155*		700	110,0 - 113,0 (109,0 - 114,0)	100	17,7-18,3 mm RW	250	7,5
				500	max. 114,0				

Checking values in brackets

* 1 mm less control rod travel than col 2

3.84

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Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 MAN 9,7 03

1. Edition

En

PES 6 A 95 D 410 RS 2108
Komb.-Nr. 0 400 876 220

RSV 250-1100 A1 B 734 L
A1 C 734 L

supersedes
company MAN
engine D 2356 HM 5 H

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $1,7 - 1,8$ mm (from BDC)
(1,65-1,85)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	9,0	7,5-8,0	0,5			
200	6,0	3,2-4,2				
	6,0	0,5-1,4				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca. 57	1100	16,0	-			ca.22	250	6,2	1080	0
	1160	8,8					100	19 - 21	300	1,0 - 1,6
	1200	4,0	without auxiliary spring				250	5,8- 6,5		
	1160	8,3-11,0					400	0 - 2,3		
2a	1200	2,9- 5,7	with auxiliary spring				500	0 - 1,0		
	1320	0,3- 1,0								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational speed limit		3a Fuel delivery characteristics		Starting fuel delivery		4a Idle stop	
Test oil temp 40°C (104°F)		Note changed to 1 rev/min				Idle			
rev/min	cm ³ /1000 strokes			rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	
1100	111,5-113,5 (110,5-114,5)	1130-1145*	-	-	100	18,2-18,8 mm RW	250	6,2	

Checking values in brackets

* 1 mm less control rod travel than col 2

3.84

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Testoil-ISO 4113

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 MAN 9,7 o1
1. Edition

En

PES 6 A 95 D 410 RS 2108 W

EP/RSV 250-1100 A 1 B 1071

supersedes

company MAN

engine D 2156 HMN 5 D

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $1,7 - 1,8$ mm (from BDC)
(1,65-1,85)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	9,0	7,5 - 8,0	0,5			
	6,0	3,2 - 4,2				
200	6,0	0,5 - 1,4				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min Degree of deflection of control lever 1			Intermediate rated speed			4 Lower rated speed Control lever deflection in degrees rev/min			3 Torque control Control rod travel rev/min mm	
Control rod travel mm 2	Control rod travel mm rev/min 3		4	5	6	7	8	9	10	11
Ca. 59	1100 1150 1190	16,0 11,4 6,0	without auxoliary spring			ca. 25	250 100 250 350	6,0 19 - 21 5,7 - 6,3 1,7 - 3,6	1100 300	0 1,2 - 1,8
2a	1160 1250 1350	8,0-11,0 1,3-3,2 0,3-1,0					450	0 - 1,0		
			with auxiliary spring							

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp. 40°C (104°F) rev/min 1		6 Rotational speed limit Note changed to rev/min 3		3a Fuel delivery characteristics rev/min 4		Starting fuel delivery Idle rev/min 6		5 Idle stop Control rod travel mm rev/min 8	
cm ³ /1000 strokes 2				cm ³ /1000 strokes 5		cm ³ /1000 strokes 7			
1100	120,5-123,5 (119,5-124,5)	1140-1155*	500	max. 118,5		100	min. 18,0 mm RW	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.84

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Testoil-ISO 4113

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 MAN 9,7 o

2. Edition

En

PES 6 A 95 D 410 RS 2108 Y EP/RSV 250-1100 A1 B 1071

supersedes 8.74

company MAN

engine D 2156 HMN 6 D

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $1,7 - 1,8$ mm (from BDC):
(1,65- 1,85)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	9,0	7,5-8,0	0,5			
200	6,0	3,2-4,2				
	6,0	0,5-1,4				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min Degree of deflection of control lever 1			Intermediate rated speed			4 Lower rated speed Control lever deflection in degrees rev/min			3 Torque control Control rod travel rev/min mm	
Control rod travel mm 2	Control rod travel mm rev/min 3		4	5	6	7	8	9	10	11
ca. 59	1100	16,0	without auxiliary spring			ca. 25	250	6,0	1100	0
	1150	11,4					100	19 - 21	300	1,2 - 1,8
	1190	6,0					250	5,7- 6,3		
2a	1160	8,0-11,0	with auxiliary spring				350	1,7- 3,6		
	1250	1,3- 3,2					450	0 -1,0		
	1350	0,3- 1,0								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp. 40°C (104°F) rev/min 1		6 Rotational speed limit Note changed to rev/min 3		3a Fuel delivery characteristics rev/min 4		Starting fuel delivery Idle rev/min 6		5 Idle stop Control rod travel rev/min mm 8	
cm ³ /1000 strokes 2				cm ³ /1000 strokes 5		cm ³ /1000 strokes 7			
1100	108,5-110,5 (107,5-111,5)	1140-1155*	500	max. 104,0		100	min. 18,0 mm RW	-	-

Checking values in brackets

* 1 mm less control rod travel than col 2
3.84

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Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 KHD 6,1 a

En

5. Edition

Testoil-ISO 4113

PES 6 A 85 D 410/3 RS 2366 EP/RSV 325-1400 A8B674D, 707 D
325-1150 A8B674D, 707 D

RS 2415

RS 2532

supersedes 1.84

company: K H D

engine: BF 6 L 913

Instructions P.3

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,9 + 0,1 mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ / 100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	9	4,1 - 4,5	0,4			
	6	0,6 - 1,4				
200	9	1,4 - 2,2				

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

EP/RSV 325-1400 A8B674D, 707D

Upper rated speed			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca. 69	1400 1450 1500	16,0 10,5 4,0	without auxoliary spring			ca. 20	325	5,5	1400	0
ca. 68	1400 1510 1600	ca. 10,0 ca. 4,0 0,3 - 1,5					200 325 500 650	19 - 21 5,2-5,8 1,2-3,3 0 - 1,5	500	1,2-1,4

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

② Full-load stop		⑥ Rotational- speed limitat.	③a Fuel delivery characteristics		Starting fuel delivery Idle		⑤a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
LDA	0,7 bar		LDA	0,7 bar	100	119,5-129,5	325	5,5**
		Instructions P. 3	LDA	0 bar				
			500	57,5-59,5				
(Increase by $\pm 1,0$ cm ³)								./.

Checking values in brackets

* 1 mm less control rod travel than col. 2

4.84

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Geschäftsbereich KH Kundendienst: Kfz-Ausrüstung.
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B. Governor Settings

EP/RSV 325-1150 A8B674D, 707 D

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca. 56	1150	16,0				ca. 21	325	5,5	1130	0
	1200	11,1								
	1250	5,4								
2a	1220	7,5-10,4					200	19 - 21	500	1,0-1,2
	1300	1,3-3,6					325	5,5-5,8		
	1380	0,3-1,5					500	1,4-3,4		
							660	0 -1,5		
			without auxoliary spring							
			with auxiliary spring							

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp. 40°C (104°F)		6 Rotational-speed limit Note: changed to ... rev/min		3a Fuel delivery characteristics		Starting fuel delivery Idle		5		4a Idle stop Control rod travel mm	
rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min			
1 LDA	2 0,7 bar	3	4 LDA 5 0,7 bar	6	7	8	9				
						100	119,5-129,5	325		5,5**	
Instructions P.3			LDA 500 0 bar 57,5-59,5								

Checking values in brackets

* 1 mm less control rod travel than col. 2

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
 increasing pressure
 XXXXXXXX

Pump/governor	Setting	Measurement	Control rod travel - diminution XXX mm reference
	Gauge pressure = bar	Gauge pressure = bar	mm MXX
all governors	0,38	0,10	0,2 - 0,3 1,6 - 2,0

Notes:

(1) when $n \geq$

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

En

C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational-speed limitation	Fuel delivery characteristics		Starting fuel delivery Idle switching point		Intermediate rotational speed Torque-control travel
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min mm
1	2	3	4	5	6	7	8

BF 6 L 913 - PES 6 A D..RS2366, 2415 - F or B output at .. min⁻¹

Testoil-ISO 4113

1400	88,0 - 90,0	1420	800	80,0 - 83,0	160 PS	/	n = 2800
1400	84,0 - 86,0	1420	800	66,0 - 69,0	142 PS	/	n = 2800
1325	90,5 - 92,5	1340	850	88,5 - 90,5	168 PS	/	n = 2650
1325	87,5 - 89,5	1340	800	82,5 - 85,5	160 PS	/	n = 2650
1325	82,5 - 84,5	1340	800	67,5 - 70,5	140 PS	/	n = 2650
1250	87,0 - 89,0	1270	800	84,5 - 87,5	160 PS	/	n = 2500
1250	83,0 - 85,0	1270	800	77,5 - 80,5	148 PS	/	n = 2500
1250	81,0 - 83,0	1270	800	75,5 - 77,5	140 PS	/	n = 2500
1200	86,0 - 88,0	1220	800	84,5 - 87,5	156 PS	/	n = 2400
1200	78,0 - 80,0	1220	800	68,0 - 71,0	135 PS	/	n = 2400
1165	84,0 - 86,0	1180	800	84,5 - 87,5	152 PS	/	n = 2330
1150	83,5 - 85,5	1165	800	84,5 - 87,5	152 PS	/	n = 2300
1150	80,0 - 82,0	1165	800	79,0 - 81,0	142 PS	/	n = 2300
1100	82,0 - 84,0	1115	800	84,5 - 87,5	147 PS	/	n = 2200
1075	82,0 - 84,0	1090	800	84,5 - 87,5	144 PS	/	n = 2150
1075	78,0 - 80,0	1090	800	76,0 - 79,0	136 PS	/	n = 2150
1050	76,5 - 78,5	1065	800	73,5 - 76,5	130 PS	/	n = 2100
1000	82,5 - 84,5	1015	800	84,5 - 87,5	137 PS	/	n = 2000
1000	77,0 - 79,0	1015	800	79,5 - 82,5	130 PS	/	n = 2000
900	82,0 - 84,0	910	800	84,5 - 87,5	125 PS	/	n = 1800
875	68,0 - 70,0	885	800	66,0 - 69,0	106 PS	/	n = 1750
750	85,0 - 87,0	760	-	-	105 PS	/	n = 1500
750	78,0 - 80,0	760	-	-	100 PS	/	n = 1500

Please note

1. ** With Liebherr excavators: single-lever control, therefore use shorter screw 1 423 400 031 and set this at 0.3 - 1.0 before the stop.
2. LDA adjustment to be carried out according to VDT-W-420/305.
3. Dimension H = 22.5 mm = basic setting of LDA.

Checking values in brackets

* 1 mm less control rod travel than col 2

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 FOR 4,2 d 1
1. Edition

En

PES 6 A 85 D 210 RS 2379 Z RSV 550 - 1150 A 5 B 737 L
Komb.-Nr. 0 400 866 068

supersedes
company Ford England
engine 360 CID

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $2,5 - 2,6$ mm (from BD ϕ) RW=9 mm,
(2,45-2,65)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	8,8 - 8,9	5,2 - 5,3	0,3 (0,45)			
550	6,5 - 6,7	1,3 - 1,7	0,25(0,4)			
Port closing difference between control rod travel 9 mm and max. = 4 - 5° camshaft						

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0 x = 4,25	-	-	-	ca. 28	550	6,6		
							550	6,5-6,7		
ca. 51	7,8	1190-1200						**		
2a	4,0	1225-1250								
	1410	0,3 - 1,7								

The numbers denote the sequence of the tests Set idle-speed auxiliary spring at 2 mm control-rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limit		3a Fuel delivery characteristics		Starting fuel delivery Idle 5		4a Idle stop	
Test oil temp 40°C (104°F)		Note changed to 1 rev/min							
rev/min 1	cm ³ /1000 strokes 2	3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9	
100	52,0 - 53,0 (50,0 - 55,0)	1190-1200	-	-	-	-	-	-	-

Checking values in brackets

* 1 mm less control rod travel than col 2

3.84

G22

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G22

②

Test Specifications Fuel Injection Pumps ② and Governors

40

VDT-WPP 001/4 MAN 9,2 a

5. Edition

En

PES 5 A 95 D 410 LS 2426 Z

RQ 250/1150 AB 839 DL

.. LS 2426, Z

RQV 250-1150 AB 850 DL

supersedes 6.82

company MAN

engine D 2555..

MX/MXF-192 PS

M/MH - Z - 168 PS

1 - 3 - 5 - 4 - 2 je $72^\circ \pm 0,5^\circ (\pm 0,75^\circ)$

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

 Port closing at prestroke $\begin{matrix} 1,3 - 1,4 \\ (1,25 - 1,45) \end{matrix}$ mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	9	7,5 - 8,0	0,4			
	6	3,2 - 4,2				
200	6	0,5 - 1,4				

Adjust the fuel delivery from each outlet according to the values in

Testoil ISO 4113

B. Governor Settings

2426 Z mit 839 D

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
①		Setting point		Test specifications		Setting point		Test specifications		③	
rev/min 1	Control rod travel mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
600	15,7-16,3	600	16,0	1170	15,0-15,4	540	0	150	6,6-8,1	880	15,8-16,0
				1200	10,0-14,4			250	4,5-6,7	1020	14,4-15,6
				1250	0 - 9			350	1,5-4,0		
				1320	0			440	0	1000	15,3-15,4

Torque-control travel on flyweight assembly dimension a = 0,2 mm

Speed regulation. At 1190 - 1205 min⁻¹

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop		Fuel delivery characteristics		Starting fuel delivery idle speed	
②		③a		③b		⑥	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3		rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes/mm 7
2426 Z							
1150	100,5 - 102,5 (98,5 - 104,5)			800	104,0 - 107,0 (102,0 - 109,0) max. 103,5 (max. 105,5)	100	146,5-156,5 =15,7- 16,3 mm RW

Checking values in brackets

3.84

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G23

G23

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 50	1170 1220 1280 1350	14,4-17,4 9,0-14,0 1,0- 7,8 0	-	-	-	ca. 13	50 150 250 350 410	7,7-11,0 6,6- 9,8 4,2- 7,2 0 - 3,4 0	200 480 800 1180	0,5-1,2 3,2-4,0 5,0-5,4 8,4

Torque control travel a = 0,4 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
1150	114,5-116,5 (112,5-118,5)	1190-1205*	800 500	114,0-117,0 (112,0-119,0) max. 113,5 (max. 115,5)	100 250	146,5 - 156,5 7 mm RW Change-over point 180-100 min ⁻¹	1100 500	0 0,3-0,5

Checking values in brackets

* 1 mm less control rod travel than col 2

Testoil-ISO 4113**B. Governor Settings**

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 50	1170 1120 1280 1350	14,4-17,4 9,0-14,0 1,0- 7,8 0	-	-	-	ca. 15	50 150 250 350 410	7,7-11,0 6,6- 9,8 4,2- 7,2 0 - 3,4 0	200 480 800 1180	0,5-1,2 3,2-4,0 5,0-4,4 8,4

Torque control travel a = 0,4 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
1150	109,5-111,5 (107,5-113,5)	1190-1205*	800 500	112,0-115,0 110,0-117,0 max. 112,5 (max. 114,5)	100 250	146,5-156,5 = 15,7- 16,3 mm RW 7 mm RW Change-over point 180-100 min ⁻¹	1100 500	0 0,3-0,5

Checking values in brackets

* 1 mm less control rod travel than col 2

En

①

Test Specifications

Fuel Injection Pumps ①

and Governors

WPP 001/4 KHD 6,1 i

4. Edition

En

PES 6 A 85 D 410/3 RS 2415

RQV 300-1250 AB 1131 L

Komb.-Nr. 0 400 836 023

supersedes 83

company KHD

engine: BF 6 L 913 T

96 KW bei 2500 min⁻¹

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil ISO 4113

A. Fuel Injection Pump Settings

 Port closing at prestroke $1,9 - 2,0$
 (1,85 - 2,05) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1250	12,0+0,1	7,8 - 7,9	0,3(0,45)			
300	8,4-8,6	1,0 - 1,6	0,2(0,4)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1385	15,2-17,8	-	-	-	ca. 17	100	min. 10,0	250	0,9-1,1
ca. 65	11,0 4,0 1525	1290-1300 1415-1445 0-1,0				450-550	300 645-705	8,4-8,6 =2,0	580 920 1250	3,9-4,1 5,4-5,6 7,8

Torque control travel a = 0,9 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F) 2		Rotational-speed limitation intermediate speed 2b 4a	Fuel delivery characteristics 5a high idle speed 5b		Starting fuel delivery idle switching point 6		Torque-control travel 5	
rev/min 1	cm³/1000 strokes 2	rev/min 3	rev/min 4	cm³/1000 strokes 5	rev/min 6	cm³/1000 strokes 7	rev/min 8	Control rod travel mm 9
1250	78,0-79,0 (76,0-81,0)	1290-1300*	600	71,5-73,5 (69,0-76,0)	100	105,0-115,0 (102,0-118,0) =17,4- 17,8 mm RW	1250 600 850	12,0+0,1 12,8+0,1 12,3+0,2

Checking values in brackets

* 1 mm less control rod travel than col. 2
3.84
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H1

①

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 KHD 19,0 i
1. Edition

En

PE12 A 95D 610 LS 2453 RQV 300-1150 AB 1086 L
Komb.-Nr. 0 400 640 105
1- 4- 9- 8- 5- 2- 11- 10- 3- 6- 7- 12
0-15-60-75-120-135-180-195-240-255-300-315 \pm 0,5° (\pm 0,75°)

supersedes

company KHD

engine F 12 L 413 F

247 kW/2300 min⁻¹

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $\frac{2,0 - 2,1}{(1,95 - 2,15)}$ mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1150	8,7-8,8	8,2 - 8,4	0,3(0,6)			
300	5,9-6,1	1,3 - 1,9	0,7(0,9)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
max.	1150	15,2-17,8	-	-	-	ca. 23	100	min. 7,5	250	0,3-0,5
ca. 60	7,7	1190-1200					300	5,9-6,1	550	2,5-2,7
	4,0	1225-1255							850	4,5-4,7
	1350	0-1,0				450-520			1150	7,8
						③a				

Torque control travel a = 0,9 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
1150	81,5-83,5 (79,5-85,5)	1190-1200*	800	83,0-92,0 (87,0-94,0)	100	120,0-130,0 (117,0-133,0)	1150	8,7-8,8
							400	9,6-9,7
							800	9,6-9,7
							1000	9,3-9,5

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.84

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H2

①

Test Specifications

Fuel Injection Pumps ① and Governors

WPP 001/4 KHD 19,0 m

2. Edition

En

PE 12 A 95 D 610 LS 2453 RQV 300-900 AB 1090 L
Komb.-Nr. 0 400 640 108

superseded by 3.83

company: KHD

engine: F 12 L 413 FW
177 kW (240 PS)
1800 min⁻¹

1- 4- 9- 8- 5 - 2 - 11- 10- 3 - 6 - 7 - 12
0-15-60-75-120-135-180-195-240-255-300-315⁰ ± 0,5⁰ (± 0,75⁰)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (1,95-2,15) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
600	9,2-9,3	7,2 - 7,4	0,35(0,6)			
300	5,9-6,1	1,0 - 1,6	0,35(0,55)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	925	15,2-17,8	-	-	-	ca. 24	100	min. 7,5	250	0,5-0,7
ca. 59	7,4 4,0 1100	940- 950 980-1010 0 - 1,0					300	5,9-6,1	470	4,0-5,2
							345-405 = 2,0		680	6,2-6,5
									900	8,2

Torque control travel a = 0,8 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational speed limitation intermediate speed		Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	4a	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
600	72,0-74,0 (70,0-76,0)	940-950*		750	80,5-83,5 (78,0-86,0)	100	19,0-21,0 mm RW	900	8,4+0,1
				850	72,5-75,5 (70,0-78,0)			500	9,2+0,1
								710	8,9+0,2
								835	8,5+0,3

Checking values in brackets

* 1 mm less control rod travel than col. 2

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3.84

H3

Testoil-ISO 4113

H3

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 KHD 4,1 c 2

2. Edition

En

PES 4 A 80 D 410/3 RS 2523 RSV 325-1250 A 8 B 540-1 L
Komb.-Nr. 0 400 864 058

supersedes 11.83

company KHD

engine F 4 L 913

Road-building machine
59 kW/2500 min⁻¹

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (1,85-2,05) mm (from BDC)

Testoil-ISO 4113

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1250	11,6+0,1	6,9-7,0	0,25(0,4)			
325	8,2-8,4	1,0-1,6	0,2 (0,35)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min Degree of deflection of control lever 1			Intermediate rated speed 4 5 6			4 Lower rated speed Control lever deflection in degrees rev/min Control rod travel mm 8 9			3 Torque control Control rod travel mm rev/min 10 11	
loose	Control rod travel mm	Control rod travel mm rev/min	-	-	-	ca. 17	325	6,5	1250	11,6-11,7
	X= 4,0						100	min. 19,5	500	12,1-12,2
ca. 56	10,6	1290-1300					325	6,9-7,1	965	11,8-12,0
	4,0	1390-1420					630-690	= 2,0		
2a	1555	0,3-1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp. 40°C (104°F) rev/min 1		6 Rotational speed limit Note changed to) rev/min 3		3a Fuel delivery characteristics rev/min 4		Starting fuel delivery Idle rev/min 6		5 Idle stop Control rod travel mm rev/min 8	
cm ³ /1000 strokes 2				cm ³ /1000 strokes 5		cm ³ /1000 strokes 7			
1250	68,5-69,5 (67,0-71,0)	1290-1300*	800	64,5-66,5 (62,5-68,5)		-	-	-	-

Checking values in brackets

* 1 mm less control rod travel than col 2

4.84

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H4

H4

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 KHD 6,1 d

3. Edition

En

PES 6 A 80 D410/3 RS2527 EP/RSV 325-1150 A8 B2014DL
Komb.-Nr. 0 400 866 084

supersedes 3.84
company KHD
engine F6 L912
74kW (102PS)
/ 2300min⁻¹
tractor DX 110-
S 31

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

1,90-2,00
Port closing at prestroke (1,85-2,05) mm (from BDC)

Testoil-ISO 4113

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	11,8	5,6 - 5,7	0,2(0,35)			
325	+0,1 8,9-9,1	0,8 - 1,2	0,2(0,3)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min Degree of deflection of control lever 1			Intermediate rated speed			4 Lower rated speed Control lever deflection in degrees rev/min			3 Torque control Control rod travel rev/min mm	
Control rod travel mm 2	Control rod travel mm rev/min 3		4	5	6	7	8	9	10	11
loose	800	0,3-1,0				ca. 23	325	8,5	1150	11,8+0,1
							100	min. 19,5	950	12,0+0,2
							325	8,9-9,1	775	12,5+0,2
							390-450	= 2,0	450	12,5+0,2
ca. 58	10,8	1190-1200								
2a	4,0	1235-1265								
	1350	0,3-1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp 40°C (104°F) rev/min 1		6 Rotational speed limit Note: changed to) rev/min 3		3a Fuel delivery characteristics rev/min 4		Starting fuel delivery Idle rev/min 6		5 Idle stop Control rod travel mm rev/min 8	
cm ³ /1000 strokes 2				cm ³ /1000 strokes 5		cm ³ /1000 strokes 7			9
1150	56,0 - 57,0 (54,5 - 58,5)	1190-1200*	775	54,0-56,0 (52,0-58,0)		-	-	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

H5

H5

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4.84

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 MB 5,7 v 11

3. Edition

En

PES 6 A 90 D 410 RS 2596

RSV 350-1400 AOB 1141 L

Komb.-Nr. 0 400 876 293

supersedes 6.83

company Daimler-Benz

engine OM 352 A

123 kW (157 PS) (1)

Schmidt rotary (2)

snow plough for
high altitudes

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $2,0-2,1$ mm (from BDC)
 $(1,95-2,15)$

Testoil-ISO 4113

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery (1) cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery (2) cm ³ /100 strokes 3	Spring pre-tensioning (torque control valve) mm 6
1380	11,7+0,1	7,2-7,3	0,3(0,45)	9,8-9,9	5,4-5,6	
350	7,9-8,1	0,8-1,4	0,2(0,4)	7,9-8,1	0,8-1,4	

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0	-	-	-	max. 14				
	x =	6,0					100	min. 16,0		
ca. 64	10,7	1420-1430					350	7,9-8,1		
2a	4,0	1520-1550					580-640	= 2,0		
	1680	0,3-1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limit		3a Fuel delivery characteristics		Starting fuel delivery 5		4a Idle stop	
Test oil temp 40°C (104°F)		Note changed to)				Idle			
rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	
LDA 1380	(1) 0,7 bar 72,0-73,0 (70,0-75,0)	1420-1430*	LDA 600	0,7 bar 68,0-71,0 (65,5-73,5)	100	78,0-88,0 (75,0-91,0)	-	-	
			LDA 500	0 bar 48,5-49,5 (46,5-51,5)		= 16,3 - 16,7 mm RW			

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.84

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H6

H6

The numbers denote the sequence of the tests

B. Governor Settings

① Upper rated speed rev/min			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
loose	800	0,3-1,0	-	-	-	ca. 31	350	8,0	1200	9,8-10,0
	x = 6,0						100	19,0-21,0	650	11,3-11,5
ca. 74	8,8	1440-1450					350	7,9- 8,1		
②a	4,0	1470-1500					440-490	= 2,0		
	1635	0,3-1,7					600	0,3- 1,0		

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop		⑥ Rotational speed limit		③a Fuel delivery characteristics		Starting fuel delivery Idle		⑤ ④a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ... rev/min							
rev/min	cm ³ /1000 strokes	3	rev/min	cm ³ /1000 strokes	5	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1 (2)	2		4			6	7	8	9
LDA 1380	0,7 bar 54,5-56,5 (52,5-58,5)	1440-1450*	LDA 1000	0,7 bar 60,2-62,2 (58,2-64,2)		100	78,0-88,0 / 16,4- 16,8 mm RW	-	-
			600	65,2-67,2 (63,2-69,2)					
			LDA 500	0 bar 53,0-55,0 (51,0-57,0)					

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure

Pump/governor	Setting	Measurement	Control rod travel
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
PES 6 A RS 2596			
(1)	0,40	0,70 0 0,21	12,8 - 12,9 11,2 - 11,3 12,5 - 12,6 11,8 - 12,0
(2)	0,52	0,70 0 0,21	12,3 - 12,4 10,4 - 11,5 12,0 - 12,1 10,8 - 11,0

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

En Testing the hydraulic start-locking device

Locking at 0,45 - 0,55 bar

Unlocking at 0,25 - 0,35 bar

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 KHD 1 o

3. Edition

En

Testoil-ISO 4113

PES 6 A 95 D 410 RS 2625

RSV 325-1150 A8B 674 DL

Komb.-Nr. 0 400 876 305

supersedes 9.83

company: KHD

engine: B F 6 L 913 B
Bagger

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

 Port closing at prestroke $\frac{1,9 - 2,0}{(1,85-2,05)}$ mm (from BDC)

Rotational speed	Control rod travel	Fuel delivery	Difference	Control rod travel	Fuel delivery	Spring pre-tensioning (torque-control valve)
rev/min	mm	cm ³ /100 strokes	cm ³ /100 strokes	mm	cm ³ /100 strokes	mm
1	2	3	4	2	3	6
1150	11,4+0,1	8,0 - 8,2	0,3(0,6)			
325	7,2-7,4	1,6 - 2,2	0,3(0,5)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	rev/min	Control rod travel
1	2	3	4	5	6	7	8	9	10	11
loose	800	0,3-1,0	-	-	-	ca. 15	325	6,8	1150	11,4+0,1
	X =	3,0							500	12,1+0,1
							325	7,2-7,4	1000	11,8+0,2
ca. 50	10,4	1190-1200					585-645	= 2,0		
⑤	4,0	1265-1295								
	1325	0,3 - 1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

② Full-load stop		⑥ Rotational-speed limitat.		③a Fuel delivery characteristics		Starting fuel delivery Idle		⑤a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ... rev/min							
rev/min	cm ³ /1000 strokes	3		rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel
1	2			4	5	6	7	8	9
LDA 1150	0,7 bar 80,0 - 82,0 (78,0 - 84,0)	1190-1200*		LDA 800	0,7 bar 83,0-86,0 (80,5-88,5)	100	116,5-126,5 (113,5-129,5) = 15,9 - 16,4 mm RW		
				LDA 500	0 bar 56,5 - 59,5 (54,5 - 61,5)				

Checking values in brackets

* 1 mm less control rod travel than col. 2

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D. Adjustment Test for Manifold Pressure Compensator

-2-

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

KHD 1 o

Pump/governor	Setting	Measurement		Control rod travel: diminution difference (1)
	Gauge pressure = bar	Gauge pressure = bar	mm	
PES 6 A..RS 2625 with..A8B 674 DL	0,7			12,2 - 12,3
		0		11,1 - 11,2
		0,36		11,9 - 12,0
		0,2		11,1 - 11,3

Notes:

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Testoil-ISO 4113

Test Specifications Fuel Injection Pumps 1A and Governors

40

WPP 001/4 KHD 1 g 3

7. Edition

En

PES 4 A 85 D 410/3 RS 2638 RSV 325-1150 A 0 B 2168 L
A 0 C 2168 L

supersedes 11.83
company KHD
engine BF 4 L 913
66 kW (90 PS)
/ 2300 min⁻¹
tractor DX 92 (1)
60 kW (82 PS)
/ 2300 min⁻¹
tractor DX 86 (2)
BF 4 L 913 T

Symbol S 29 =

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,5 - 2,6
(2,45-2,65)

mm (from BDC)

Symbol S 28 =

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre tensioning (torque control valve) mm 6
1150	11,8+0,1	8,2 - 8,3	0,3(0,45)	10,6+0,1	7,5-7,6	
325	7,7-7,9	0,9 - 1,5	0,2(0,4)	7,7-7,9	1,0-1,6	

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0	-	-	-	ca. 29	325	7,3	1150	11,8+0,1
	X =	4,0					100	min. 19,5	500	12,3+0,1
							325	7,7-7,9	965	12,0+0,2
ca. 53	10,8	1190-1200					700-760	= 2,0		
2a	4,0	1325-1355								
	1495	0,3 - 1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational speed limit		3a Fuel delivery characteristics		Starting fuel delivery Idle		4a Idle stop	
Test oil temp. 40°C (104°F)		Note changed to 1 rev/min							
rev/min 1	cm ³ /1000 strokes 2	3	4	5	6	7	8	9	
(1) 1150	80,5-81,5 (78,5-83,5)	1190-1200*	800	79,0-82,0 (76,5-84,5)	100	108,5-118,5 = RW 16,9 - 17,4	-	-	

Checking values in brackets

* 1 mm less control rod travel than col 2

4.84

H10

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H10

B. Governor Settings

① Upper rated speed rev/min			Intermediate rated speed			④ Control-lever deflection in degrees	Lower rated speed		③ Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min					rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
loose	800	0,3-1,0	-	-	-	ca.26	325	7,0	1150	10,5+0,1
	x = 4,0						100	min.19,0	500	11,2+0,1
ca. 36	9,6	1220-1230					325	7,4-7,6	900	10,9+0,3
	4,0	1325-1355					720-780	= 2,0		
②a	1475	0,3-1,7								

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop		⑥ Rotational-speed limitat Note: changed to ...) rev/min	③a Fuel delivery characteristics		Starting fuel delivery idle		⑤	④a Idle stop	
Test oil temp. 40°C (104°F)									
rev/min	cm³/1000 strokes		rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm	
1	2	3	4	5	6	7	8	9	
(2) 1150	74,5-75,5 (72,5-77,5)	1220-1230*	300	65,5-68,5 (63,5-70,5)	100	108,5-118,5	-	-	

* 1 mm less control rod travel than col. 2

Checking values in brackets

Testoil-ISO 4113**B. Governor Settings**

① Upper rated speed rev/min			Intermediate rated speed			④ Control-lever deflection in degrees	Lower rated speed		③ Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min					rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
②a										

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop		⑥ Rotational-speed limitat. Note: changed to ...) rev/min	③a Fuel delivery characteristics		Starting fuel delivery		⑤	④a Idle stop	
Test oil temp. 40°C (104°F)			Note: changed to ...) rev/min		Idle			Control rod travel	
rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	

* 1 mm less control rod travel than col. 2

Checking values in brackets

En

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 KHD 1 g 1

3. Edition

En

PES3A85D410/3 RS 2642 RSV325-1150A8B2102-1L
Komb.-Nr. 0 400 863 007
1 - 3 - 2 je 120° $\pm 0,5^\circ$ ($\pm 0,75^\circ$)

supersedes 9.82
company: KHD
engine F3L 913
42 kW (57 PS)₁
2300 min
Schlepper D 6007-S23

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (2,45-2,65) mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ / 100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1150	11,5+0,1	7,1-7,3	0,3 (0,4)			
325	8,9-9,1	1,7-2,3	0,2 (0,4)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
lose	800	0,3-1,0	-	-	-	ca. 20	325	8,5	1150	11,5+0,1
	X=						100	min. 19,0	700	11,8+0,1
							325	8,9-0,1	1075	11,6+0,3
							485-545	2,0		
⑤ ca. 54	10,2	1190-1200								
	4,0	1265-1295								
	1350	0,3-1,7								

** Set speed regulation before torque control

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

② Full-load stop		⑥ Rotational-speed limit		③a Fuel delivery characteristics		Starting fuel delivery idle		⑤a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to rev/min							
rev/min	cm ³ /1000 strokes	3		rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2			4	5	6	7	8	9
1150	70,5-73,5 (68,5-75,5)	1190-1200 *		700	66,0-67,0 (64,0-69,0)	100	133,5-143,5	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2
2.84

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 RAB 10,8 a

3. Edition

En

Testoil-ISO 4113

PES 6 A 100 D 410 RS 3039 RSV 475-950 A 1 B 2121 L
Komb.-Nr. 0 401 276 051 A 1 C 2121 L

supersedes 8.82

company RABA

engine 184 kW (250 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at presroke $\frac{1,6}{(1,55-1,75)}$ - $\frac{1,7}{(1,55-1,75)}$ mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
950	13,6+0,1	15,2-15,4	0,3 (0,6)			
475	5,9-6,1	1,2-1,6	0,3 (0,5)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever 1	rev/min 2	Control rod travel mm 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0	-	-	-	ca. 27	475	5,5	950	13,6+0,1
	x = 3,75						100	min. 19,5	500	15,3+0,2
							475	5,9-6,1	840	14,4+0,2
⑤ 49	12,6	990-1000					570-630	= 2,0		
	4,0	1030-1060					675	max. 1,0		
	1195	0,3-1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

② Full-load stop		⑥ Rotational speed limit		③a Fuel delivery characteristics		Starting fuel delivery idle		⑤a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ... rev/min							
rev/min 1	cm ³ /1000 strokes 2	rev/min 3		rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
LDA 950	0,7 bar 152,0-154,0 (150,0-156,0)	990-1000*		LDA 750	0,7 bar 180,0-184,0 (178,0-186,0)	-	-	-	-
				LDA 500	0 bar max. 149,0 (max. 151,0)				

Checking values in brackets

* 1 mm less control rod travel than col. 2

D. Adjustment Test for Manifold Pressure Compensator

RAB 10,8 a

Test at n =

500

rev/min decreasing pressure - in bar gauge pressure
increasing

-2-

Pump/governor	Setting	Measurement	Control rod travel
	Gauge pressure - bar	Gauge pressure - bar	diminution difference mm (1)
PES 6A..RS 3039 with..A 1 B 2121L	0,7		15,3 - 15,4
		0	13,7 - 13,8
		0,55	15,0 - 15,1
		0,42	14,1 - 14,3

Notes

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Testoil-ISO 4113

①

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 VOB 7,0 a

1. Edition

En

PE 6 P 100 A 320 RS 256 RQV 250-1200 PA 212/2 R

supersedes

company Volvo-BM

engine D 70 B

Sleeve position 36,0 mm

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

2,8-2,9
(2,75-2,95)

mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	12,3-13,1	0,5			
600	9	5,2-6,2				
	12	11,1-12,4				
200	15	16,6-18,2				
	9	3,2-4,2				

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1290	15,0-18,3	-	-	-	ca. 23	120	8,3-10,0	1290	8,2
ca. 66	1560	0					250	6,2-8,2		
	1200	15,1-18,2					350	3,3-5,4		
	1300	8,0-13,1					500	0 - 2,5		
	1400	0 - 7,3					570	0		
	1520	0								

Torque control travel a =

mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
700	73,0-75,0	1230-1240*	-	-	100	230,0-270,0	-	-
					225	10,0-16,0		

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.74

H15

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H45

Test Specifications Fuel Injection Pumps ② and Governors

WPP 001/ 4 DAF 11,6 o5

1. Edition

En

PE6P 110 A 320 RS 372
Komb.-Nr. 0 401 846 405

RQ 250/1100 PA 428/2R

supersedes

company: DAF

engine: DKTL 1160

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $2,8 - 2,9$ mm (from BDC)
(2,75-2,95)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
850	12,3+0,1	14,0-14,2	0,4(0,8)			
250	6,7-6,9	0,7- 0,9	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Checking of slider PRG check rev/min 1		Full-load speed regulation Setting point rev/min 3		Test specifications Control rod travel mm 5 rev/min 6		Idle speed regulation Setting point rev/min 7 Control rod travel mm 8		Test specifications rev/min 9 Control rod travel mm 10		Torque control rev/min 11 Control rod travel mm 12	
700	15,6-16,4	700	16,0	11,3 4,0 1400	1145-1160 1220-1250 0-1,0	250	6,8	100 250 320-380	min. 8,3 6,7- 6,9 = 2,0	-	-

Torque-control travel
on flyweight assembly dimension a = mm

Speed regulation: At

1145-1160 min.

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) rev/min 1 cm ³ /1000 strokes 2		Control rod stop rev/min 3		Fuel delivery characteristics rev/min 4 cm ³ /1000 strokes 5		Starting fuel delivery Idle speed rev/min 6 cm ³ /1000 strokes/mm 7	
LDA 850	0,5 bar 140,5-142,5 (137,5-145,5)	-	-	LDA 600	0 bar 136,5-139,5 (133,5-142,5)	100	240,0-280,0 =20,0-21,0 mmRW

Checking values in brackets

3.84

D. Adjustment Test for Manifold Pressure Compensator

DAF 11,6 o5

-2-

Test at n = 600 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution difference mm (1)
PE6P..RS 372 +RQ..PA 428/2R	0,70	0 0,30	12,3-12,4 12,0-12,1 12,1-12,2

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

①

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 HIP 11,9a1
1. Edition

En

PE6P 110 A 720 RS 380
Komb.-Nr. 0 401 846 501

RQV 250-1000 PA 434-2

supersedes
company Hispavinsa
engine BSR 36 C

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $\begin{matrix} 2,8 - 2,9 \\ (2,75 - 2,95) \end{matrix}$ mm (from BDC) $P_{14} = 9,0 - 12,0$ mm

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	15,5+0,1	18,8 - 19,0	0,4(0,75)			
250	8,5-8,7	2,4 - 3,0	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
max.	100	15,2-17,8	-	-	-	ca. 15	100	min. 10,0	250	1,1-1,2
							250	8,5- 8,7	370	2,5-3,5
							310-370 =	2,0	430	3,8-4,0
ca. 46	4,5	1040-1050							1045	7,9
	4,0	1170-1200								
	300	0-1,0								

Torque control travel a = - mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
LDA 1000	0,7 bar 188,0-190,0 (185,0-193,0)	1040-1050*	LDA 500	0 bar 141,0-144,0 (138,5-146,5)	-	-	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2
3.84

Test 110 4113

H18

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H48

D. Adjustment Test for Manifold Pressure Compensator

HIP 11,9a1

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting	Measurement	Control rod travel- diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
PE6P..RS 380 +RQV..PA 434-2	0,70	0 0,45 0,31	15,5-15,6 13,2-13,3 15,0-15,1 13,7-13,9

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 DAF 11,6 v

1. Edition

En

PE6P110 A 320 RS 407-1

RSV 275-1000 P5/458-3

supersedes

DAF

company

engine DKCL 1160

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $2,8 - 2,9$ mm (from BDC) RW = 9,0 - 12,0 mm
(2,75- 2,95)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
600	12,3+0,1	13,8-14,1	0,4 (0,75)			
275	7,0-7,2	1,0- 1,5	0,45(0,75)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
loose	800	0,3-1,0	-	-	-	ca.23	275	6,6	600	12,5-12,6
	x = 4,5						275	7,0-7,2	1000	11,1-11,3
ca. 48	10,1	1040-1050					675-735	= 2,0	750	12,1-12,3
2a	4,0	1160-1190							850	11,4-11,7
	1325	0,3-1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limit		3a Fuel delivery characteristics		Starting fuel delivery		4a Idle stop	
Test oil temp 40°C (104°F)		Note changed to 1 rev/min		Note		Idle		Control rod travel	
rev/min	cm ³ /1000 strokes	3	rev/min	cm ³ /1000 strokes	5	rev/min	cm ³ /1000 strokes	rev/min	mm
1	2		4			6	7	8	9
LDA 600	0,7 bar 137,5-140,5 (135,0-143,0)	1040-1050*	LDA 1000	0,7 bar 114,5-119,5 (111,5-122,5)		100	245,0-265,0 (241,0-269,0)	275	7,1
			LDA 600	0 bar 135,5-138,5 (132,5-141,5)					

Checking values in brackets

* 1 mm less control rod travel than col 2

3.84

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Testoil-ISO 4113

H20

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D. Adjustment Test for Manifold Pressure Compensator

Test at n = 600 rev/min decreasing pressure - in bar gauge pressure increasing

DAF 11,6 v

-2-

Pump/governor	Setting	Measurement		Control rod travel	diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm	(1)	
PE6P..RS 407-1 +RSV..P5/458-3	0,70			12,3-12,4	
		0		12,1-12,2	
		0,28		12,2-12,3	

Notes

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 PEN 7,0 i

1. Edition

En

PE 6 P 110 A 320 RS 465

RSV 650-750 P4/421

Komb.-Nr. 0 401 876 267

supersedes

company Volvo-Penta

engine TD 70 G

120 KW

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $3,0 - 3,1$ mm (from BDC) RW = $9,0 - 12,0$ mm
(2,95-3,15)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	12,5±0,1	13,1-13,3	0,4(0,75)			2,5± 0,1
650	4,9-5,1	1,6- 2,0	0,3(0,6)			(2,2-2,9)

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0	-	-	-	ca. 33	650	6,1	-	-
	x= 3,25						650	6,0-6,2		
ca. 37	11,5	750-755					660-700	=2,0		
2a	4,0	775-785								
	925	0,3-1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational speed limit		3a Fuel delivery characteristics		Starting fuel delivery idle		5 Idle stop	
Test oil temp 40°C (104°F)		Note changed to rev/min		rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3		4	5	6	7	8	9
700	131,0-133,0 (128,0-136,0)	750-755*	-	-	-	-	-	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.84

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Testoil 90 4113

②

Test Specifications Fuel Injection Pumps ② and Governors

40

WPP 001/4 MB 9,6 f
3. Edition

En

PE 6 P 100 A 320 LS 805 RQ 900 PA 310 R
Komb.-Nr. 0 401 846 393

1- 6- 3- 5- 2- 4
0-75-120-195-240-315° ± 0,5° (± 0,75°)

supersede 9.78
company Daimler-Benz
OM 401
engine 110 kW (150 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke ^{3,4-3,5}
(3,35-3,55) mm (from BDZ) 1. 6

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
850	10,7+0,1	9,8-10,0	0,3(0,6)			
350	7,8-8,0	2,3- 2,8	0,3(0,5)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
①		Setting point		Test specifications		④		⑤		③	
rev/min	Control rod travel mm	rev/min	Control rod travel mm	Control rod travel mm	rev/min	rev/min	Control rod travel mm	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11	12
-	-	-	-	9,7 4,2 1050	915-920 940-950 0-1,0	-	-	-	-	-	-

Torque-control travel
on flyweight assembly dimension a =

mm

Speed regulation: At

915-920 min⁻¹1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop		Fuel delivery characteristics		Starting fuel delivery Idle speed	
②		③a		③b		⑥	
rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8
850	98,0 - 100,0 (96,0 - 102,0)	-	-	-	-	100	110,0-130,0
						945	4,1- 4,3 mmRW max.Streuung 4 (6)

Checking values in brackets

3.84

Testoil-ISO 4113

H23

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H23

②

Test Specifications Fuel Injection Pumps ② and Governors

40

WPP 001/4 MB 9,6 f2

1. Edition

En

PE 6 P 100 A 320 LS 805

RQ 750 PA 374 R

Komb.-Nr. 0 401 846 383

supersedes

company Daimler-Benz

engine OM 401

139 kW

1- 6- 3- 5- 2- 4
0-75-120-195-240-315° ± 0,5° (± 0,75°)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke ^{3,4 - 3,5} (3,35-3,55) mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
700	11,2+0,1	9,9-10,1	0,3(0,6)			
350	7,8-8,0	2,4- 2,9	0,3(0,7)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
①		Setting point		Test specifications		④		⑤		③	
rev/min	Control rod travel mm	rev/min	Control rod travel mm	Control rod travel mm	rev/min	rev/min	Control rod travel mm	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11	12
-	-	-	-	10,2 4,8 850	750-755 780-790 0-1,0	-	-	-	-	-	-

Torque-control travel
on flyweight assembly dimension a =

mm

Speed regulation: At

750-755 min⁻¹

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop		Fuel delivery characteristics		Starting fuel delivery idle speed	
②		③a		③b		⑥	
rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes/mm
1	2	3	4	5	6	7	8
700	99,0-101,0 (97,0-103,0)	-	-	-	-	100	110,0-130,0 (106,0-134,0)

Checking values in brackets

3.84

Testoil-ISO 4113

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Test Specifications Fuel Injection Pumps ② and Governors

WPP 001/4 MB 9,6 f1
1. Edition

En

PE 6 P 100 A 320 LS 805
Komb.-Nr. 0 401 846 394

RO 1150 PA 407

supersedes

company Daimler-Benz

engine OM 401

132 kW (179 PS)

1- 6- 3 - 5- 2- 4
0-75-120-195-240-315° ± 0,5° (± 0,75°)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $3,4 - 3,5$ mm (from BDC Zyl. 6)
(3,35-3,55)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	11,1+0,1	10,8-11,0	0,3(0,6)			
350	7,8-8,0	2,3- 2,8	0,3(0,5)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Checking of slider PRG check rev/min 1		Full-load speed regulation Setting point rev/min 3		Test specifications Control rod travel mm 5		Idle speed regulation Setting point rev/min 7		Test specifications Control rod travel mm 10		Torque control rev/min 11		Control rod travel mm 12	
	Control rod travel mm 2		Control rod travel mm 4		rev/min 6		Control rod travel mm 8		rev/min 9		Control rod travel mm 12		
-	-	-	-	10,2 4,1 1300	1155-1160 1195-1205 0-1,0	-	-	-	-	-	-	-	-

Torque-control travel
on flyweight assembly dimension a = - mm

Speed regulation: At 1155-1160 min⁻¹

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) rev/min 1		Control rod stop rev/min 3		Fuel delivery characteristics rev/min 4		Starting fuel delivery Idle speed rev/min 6		Control rod travel mm 7	
	cm ³ /1000 strokes 2				cm ³ /1000 strokes 5				
1100	108,0 - 110,0 (106,0 - 112,0)	-	-	-	-	100	110,0-130,0		
						1200	4,0- 4,2 mmRW Streuung max. 4 (6)		

Checking values in brackets

3.84

②

Test Specifications

Fuel Injection Pumps ②

and Governors

40

WPP 001/4 MB 12,8b2

4. Edition

En

PE 8 P 100 A 320 LS 810

RQ 300/1250 PA 187 R

superseded 8.83

Komb.-Nr. 0 401 848 038

company Daimler-Benz

engine OM 402

1 - 8 - 7 - 2 - 6 - 3 - 5 - 4 je $45^\circ \pm 0,5^\circ (\pm 0,75^\circ)$

188 kW (256 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

 Port closing at prestroke $3,4 - 3,5$
 (3,35-3,55) mm (from BDC) $2y1.8$

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1250	10,6+0,1	10,2-10,4	0,3(0,6)			
300	7,4-7,6	1,3- 1,9	0,3(0,5)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Checking of slider PRG check ①		Full-load speed regulation ④				Idle speed regulation ⑤				Torque control ③	
rev/min 1	Control rod travel mm 2	Setting point rev/min 3	Control rod travel mm 4	Test specifications Control rod travel mm 5	rev/min 6	Setting point rev/min 7	Control rod travel mm 8	Test specifications rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
600	13,8-14,6	600	14,2	9,6	1295-1310	300	7,5	100	min.9,0	1250	10,6-10,7
				4,0	1345-1375			300	7,4-7,6	600	10,6-10,8
				1500	0-1,0			405-445	= 2,0		

Torque-control travel
on flyweight assembly dimension a = mm

Speed regulation: At

1295-1310 min⁻¹1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) ②		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery Idle speed ⑥	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes/mm 7
1250	102,0 - 104,0 (100,0 - 106,0)	600	600	77,0 - 82,0 (74,5 - 84,5)	100	110,0 - 130,0 (106,0-134,0)

Checking values in brackets

3.84

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Testoil-ISO 4113

J2

J2

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 MB 12,8 c
3. Edition

En

PE 8 P 100 A 320 LS 819 RSV 350-1100 PO/809 DR
Komb.-Nr. 0 401 878 082
1 - 8 - 7 - 2 - 6 - 3 - 5 - 4 je $45^\circ \pm 0,5^\circ (\pm 0,75^\circ)$

supersedes 10.74
company Daimler-Benz
engine OM 402
220 PS

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $3,4 - 3,5$
 $(3,35 - 3,55)$ mm (from BDZyl. 8

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1080	9,3-9,4	8,2-8,4	0,35 (0,6)			
350	7,5-7,7	2,0-2,5	0,35 (0,55)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min Degree of deflection of control lever 1			Intermediate rated speed			4 Lower rated speed Control-lever deflection in degrees 7			3 Torque control Control rod travel mm 11	
Control rod travel mm 2	Control rod travel mm rev/min 3		4	5	6	rev/min 8	Control rod travel mm 9		rev/min 10	
loose	800	0,3-1,0	-	-	-	ca. 34	350	7,6	1080	9,3-9,4
	x = 4,75							**	900	9,3-9,4
ca. 56	8,3	1120-1130							600	9,8-10,0
2a	4,0	1180-1210								
	1300	0,3-1,7								

The numbers denote the sequence of the tests Set idle-speed auxiliary spring at 2 mm control-rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp 40°C (104°F) rev/min 1		6 Rotational-speed limit Note changed to rev/min 3		3a Fuel delivery characteristics rev/min 4		Starting fuel delivery Idle rev/min 6		5 Idle stop Control rod travel mm 9	
cm ³ /1000 strokes 2				cm ³ /1000 strokes 5		cm ³ /1000 strokes 7		rev/min 8	
1080	82,0-84,0 (80,0-86,0)	1120-1130*	600	76,0-80,0 (73,5-82,5)	100	110,0-130 (106,0-134,0)	0 -	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.84

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Testoil-ISO 4113

Test Specifications Fuel Injection Pumps **(1A)** and Governors

40

WPP 001/4 MB 12,8 c 1

1. Edition

En

PE 8 P 100 A 320 LS 819
Komb.-Nr. 0 401 878 085

RSV 350-1250 P0/810

supersedes
company Daimler-Benz
engine OM 402
256 PS

1 - 8 - 7 - 2 - 6 - 3 - 5 - 4 je $45^\circ \pm 0,5^\circ (\pm 0,75^\circ)$

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $\begin{matrix} 3,4 & -3,5 \\ (3,35 & -3,55) \end{matrix}$ mm (from BDC) $\begin{matrix} 2 \\ 2 \end{matrix}$ 1. 8

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1230	10,2+0,1	10,0-10,2	0,3(0,6)			
350	7,4-7,6	1,5- 2,1	0,3(0,5)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

(1) Upper rated speed rev/min			Intermediate rated speed			(4) Lower rated speed			(3) Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
100se	300	0,3-1,0 x = 5,0	-	-	-	ca. 38	350	7,5 **	-	-
ca. 66	9,2 5,0 1440	1260-1270 1330-1350 0,3 - 1,7					500-560	=2,0		

The numbers denote the sequence of the tests Set idle-speed auxiliary spring at 2 mm control-rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop		(6) Rotational-speed limitat		(3a) Fuel delivery characteristics		Starting fuel delivery (5)		(4a) Idle stop	
Test oil temp. 40°C (104°F)		Note changed to : rev/min		rev/min		rev/min		rev/min	
rev/min 1	cm ³ /1000 strokes 2	3		rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
1230	100,0-102,0 (98,0-104,0)	1260-1270*	-	-	-	100	110,0-130,0 (106,0-134,0)	0 -	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.84

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Testoil CO 4113

J4

J4

①

Test Specifications Fuel Injection Pumps and Governors

① P 001/4 SCA 11,0 r
6. Edition

En

PE 6 P 110 A 720 RS 3040, I...Z RQV 250-1100 PA 379 R

Komb.-Nr. 0 401 846 710

supersedes 83
compatible with
engine DS 1101

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke $3,3-3,4$
(3,25-3,45) mm (from BDC) RW = 9,0 - 12,0 mm

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1100	13,0±0,1	15,5-15,7	0,6(0,8)			3,3 ± 0,1 (3,0-3,5)
225	4,4-4,6	1,7-2,1	0,2(0,4)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
max.	1100	15,2-17,8	-	-	-	ca. 10	100	min. 5,9	200	1,0-1,2
							225	4,4-4,6	500	3,8-4,0
							310-370	= 2,0	800	5,4-5,6
ca. 64	12,0	1140-1150							1100	8,5
	4,0	1250-1280								
	1400	0 - 1,0								

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational speed	Fuel delivery characteristics		Starting fuel delivery		Torque-control	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
LDA 1100	0,9 bar 155,0-157,0 (153,0-159,0)	1140-1150 *	LDA 600	0,9 bar 160,5-163,5 (158,0-166,0)	100	240,0-290,0 = 20,0-21,0 mm RW	-	-
			LDA 500	0 bar 128,0-132,0 (126,0-134,0)				

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.84

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D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

SCA 11,0 r -2-

Pump/governor	Setting	Measurement	Control rod travel - diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
PE 6 P..RS 3040 + RQV ... PA 379R	0,90	0 0,37 0,25	13,0 - 13,1 11,7 - 11,8 12,7 - 12,8 11,8 - 12,0

Notes

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Increased or reduced outputs of the types listed on page 1

Testoil-ISO 4113

Output variation	Output %	Fuel delivery in cm ³ /1000 strokes at pump speed (min ⁻¹) 1)				Adjustment of control-rod position from 100% setting (mm)
		1100	900	750	600	
P	120	205	208	212	214	+ 2,6
U	115	191	196	198	200	+ 1,9
R	113	186	191	192	195	+ 1,7
W	110	180	185	185	188	+ 1,3
V	108	175	179	179	183	+ 1,0
Y	105	170	173	172	177	+ 0,7
T	103	166	167	166	171	+ 0,4
S	98	154	156	156	158	- 0,2
X	95	146	149	149	150	- 0,5
Q	93	141	145	145	146	- 0,8
Z	90	134	138	139	140	- 1,1
O	88	131	134	136	137	- 1,3
N	85	124	126	130	131	- 1,6
M	80	114	115	119	121	- 2,1
L	75	105	106	108	111	- 2,6
K	70	98	98	98	99	- 3,0
J	65	89	90	90	90	- 3,4
I	60	86	84	83	80	- 3,8

1) Tolerances with fuel quantity are $\pm 1 \text{ cm}^3$ at setting speed.

With subsequent orders from KH/ALP only the standard setting according to page 1 will be delivered. If required, the above mentioned variations are to be carried out through your local BOSCH Service Station.

The delivery amounts given in the table have been compiled from Saab-Scania documentation upon their request.

Test Specifications Fuel Injection Pumps ② and Governors

WPP 001/4 SCA 11,0 r 1

5. Edition

En

PE 6 P 110 A 720 RS 3040
Komb.-Nr. 0 401 846 717

RQ 250/1100 PA 411 R

supersedes 6.83

company Scania

engine DS 11 01

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $3,3 - 3,4$ mm (from BDC) RW = $9,0 - 12,0$ mm
(3,25-3,45)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	13,0+0,1	15,5-15,7	0,6(0,8)			3,3± 0,1
225	4,4-4,6	1,7- 2,1	0,2(0,4)			(3,0- 3,5)

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

Checking of slider PRG check rev/min 1		Full-load speed regulation Setting point rev/min 3				Idle speed regulation Setting point rev/min 7				Torque control rev/min 11	
Control rod travel mm 2		Test specifications Control rod travel mm 4		Test specifications rev/min 6		Test specifications Control rod travel mm 8		Test specifications rev/min 9		Control rod travel mm 12	
700	15,6-16,4	700	16,0	12,0	1145-1160	225	4,5	100	min. 5,9	-	-
				4,0	1230-1260			225	4,4-4,6		
				1350	0-1,0			300-360	=2,0		

Torque-control travel
on flyweight assembly dimension a = mmSpeed regulation: A! 1145-1160min⁻¹1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) rev/min 1		Control rod stop rev/min 3		Fuel delivery characteristics rev/min 4		Starting fuel delivery Idle speed rev/min 6	
cm ³ /1000 strokes 2				cm ³ /1000 strokes 5		cm ³ /1000 strokes/mm 7	
LDA 1100	0,9 bar 155,0-157,0 (153,0-159,0)			LDA 600	0,9 bar 160,5-163,5 (158,0-166,0)	100	240,0-290,0 =20,0- 21,0 mm RW
				LDA 500	0 bar 128,0-132,0 (126,0-134,0)		

Checking values in brackets

3.84

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure increasing

SCA 11,0 r 1 -2-

Pump/governor	Setting	Measurement	Control rod travel- diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
PE 6 P .. RS 3040 +RQ.. PA 411 R	0,90	0	13,0-13,1
		0,37	11,7-11,8
		0,25	12,7-12,8
			11,8-12,0

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

①

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 ROL 12,2 b
1. Edition

En

PE 6 P 120 A 320 RS 3042

ROV 350/650-750 PA 386 R

supersedes

company Rolls Royce

engine C 6 TCA

1 - 4 - 2 - 6 - 3 - 5 je 60° ± 0,5° (± 0,75°)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $\frac{3,4}{(3,35-3,55)}$ mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
720	14,8+0,1	31,9-32,3	0,5(0,8)			
350	4,3-4,5	1,4- 1,8	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
max.	730	15,2-17,8	ca. 38	13,8	675-685	ca. 12	100		325	0,5-1,6
ca. 65	13,8	750 - 755		4,0	715-745		350	4,3-4,5	350	1,9-2,1
	4,0	775 - 785					645-705	=2,0	600	2,2-3,5
	900	0 - 1,0							650	7,4
						3a			750	

Torque control travel a = - mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
720	319,0-323,0 (316,0-326,0)	750 - 755*	-	-	100	17-18 mm RW	-	-
					350	14,0-18,0		

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.84

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J10

②

Test Specifications Fuel Injection Pumps ② and Governors

40

WPP 001/4 ROL 16,2 a

1. Edition

En

PE 8 P 120 A 920/4 RS 3047

RQ 750 PA 416 R

Komb.-Nr. 0 401 848 707

supersedes

company: Rolls Royce

engine: C 8 TCA

250 kW (340 PS)

1 - 6 - 2 - 5 - 8 - 3 - 7 - 4 je $45^\circ \pm 0,5^\circ (\pm 0,75^\circ)$

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $3,5 - 3,6$ mm (from BDC) RW = $9,0 - 12,0$ mm
(3,45-3,65)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	14,4±0,1	24,7-25,1	0,5 (0,9)			
300	6,1-6,3	3,8- 4,4	0,8 (1,2)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Checking of slider PRG check ①		Full-load speed regulation ④				Idle speed regulation ⑤				Torque control ③	
rev/min 1	Control rod travel mm 2	Setting point rev/min 3	Control rod travel mm 4	Control rod travel mm 5	Test specifications rev/min 6	Setting point rev/min 7	Control rod travel mm 8	Control rod travel mm 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
-	-	-	-	13,4 4,0 900	750-755 775-785 0-1,0	-	-	-	-	-	-

Torque-control travel on flyweight assembly dimension a = mm

Speed regulation: At

750-755 min⁻¹
1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) ②		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery Idle speed ⑥	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes/mm 7
700	247,0-251,0 (244,0-254,0)	-	-	-	100	19,5-21,0 mm RW

Checking values in brackets

3.84

Testoil-ISO 4113

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J11

J11

②

Test Specifications Fuel Injection Pumps ② and Governors

40

WPP 001/4 ROL 16,2 a 1

1. Edition

En

PE 8 P 120 A 920/4 RS 3047
Komb.-Nr. 0 401 848 716

RQ 900 PA 491

supersedes

company: Rolls Royce

engine: C 8 TCA

250 kW (340 PS)

1- 6 - 2 - 5 - 8 - 3 - 7 - 4 je $45^\circ \pm 0,5^\circ (\pm 0,75^\circ)$

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke $(3,45-3,65)$ mm (from BDÇ) RW= 9,0 - 12,0 mm

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
850	14,4+0,1	24,7-25,1	0,5 (0,9)			
300	6,1-6,3	3,8- 4,4	0,8 (1,2)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
①		Setting point		Test specifications		Setting point		Test specifications		③	
rev/min	Control rod travel mm	rev/min	Control rod travel mm	Control rod travel mm	rev/min	rev/min	Control rod travel mm	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11	12
-	-	-	-	13,4 4,0 1050	900-905 932-941 0-1,0	-	-	-	-	-	-

Torque-control travel

on flyweight assembly dimension a =

mm

Speed regulation: $900-905 \text{ min}^{-1}$

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop	Fuel delivery characteristics		Starting fuel delivery idle speed	
②		③a	③b		⑥	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes/mm
1	2	3	4	5	6	7
850	247,0-251,0 (244,0-254,0)	-	-	-	100	19,5-21,0 mm RW

Checking values in brackets

3.84

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J12

J12

Test Specifications Fuel Injection Pumps ② and Governors

WPP 001/4 SAU 12,0 d 1

1. Edition

En

PES 6 P 120 A 420 RS 3049-1 RQ 300/1100 PA 687

1 - 4 - 2 - 6 - 3 - 5 je $60^\circ \pm 0,5^\circ$ ($\pm 0,75^\circ$)

Values only apply to test nozzle-and-holder
assembly 1 688 901 019 and fuel-injection test
tubing 1 680 750 067

supersedes_

company: Saurer

engine: D4KTM

235 kW

Komb.-Nr.0 402 046 744

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $2,8 - 2,9$
($2,75 - 2,95$) mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1100	11,7+0,1	19,9-20,1	0,5(0,9)			
300	3,9-4,1	1,4-2,0	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Checking of slider PRG check ①		Full-load speed regulation ④				Idle speed regulation ⑤				Torque control ③	
rev/min	Control rod travel mm	Setting point rev/min	Control rod travel mm	Test specifications Control rod travel mm	rev/min	Setting point rev/min	Control rod travel mm	Test specifications rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11	12
750	13,1-13,9	750	13,5	10,7 4,0 1350	1145-1160 1200-1230 0-1,0	300	4,0	100 300 385-425=2,0	min. 5,4 3,9-4,1 385-425=2,0	1100 920 825 700	11,7-11,8 12,0-12,3 12,5-12,7 12,7-12,8

Torque-control travel on flyweight assembly dimension a = 0,45 mm

Speed regulation: At 1145-1160 min⁻¹

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever ② Test oil temp. 40°C (104°F)		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery idle speed ⑥	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes / mm
1	2	3	4	5	6	7
LDA 1100	0,7 bar 199,0-201,0 (196,0-204,0)	-	LDA 700	0,7 bar 211,0-217,0 (208,0-220,0)	100	200,0-230,0
			LDA 400	0 bar 123,0-127,0 (120,0-130,0)		

Checking values in brackets

3.84

Testoil-ISO 4113

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure increasing

SAU 12,0 d1

-2-

Pump/governor	Setting	Measurement	Control rod travel - diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
PES 6 P..RS 3049-1 +RQ .. PA 687	0,70	0	12,7-12,8
		0,40	10,1-10,2
		0,20	12,3-12,4
			10,4-10,6

Notes.

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

①

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 KHD 15,8 e

3. Edition

En

PE 10 P 110 A 920/5 LS 3073 RQV 300-1250 PA 549-1

Komb.-Nr. 0 401 849 704

1-10- 9- 4- 3- 6- 5- 8- 7- 2

0-72-72-99-144-171-216-243-288-315° ± 0,5° (± 0,75°)

superseded 4s. 83

company KHD

 engine: BF 10 L 413 F
 294 KW (400 PS) (1)
 265 KW (360 PS) (2)
 bei 2500 min⁻¹

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $(2,8-2,9)$ mm (from BDC) RW = 9,0 - 12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1250	12,1+0,1	14,9-15,1	9,4 (0,8)			
300	6,3-6,5	1,1-1,5	0,45 (0,75)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1300	15,2-17,8	-	-	-	ca. 22	100	min. 8,2	250	0,5-0,8
ca. 66	11,1 4,0 1500	1290-1300 1370-1400 0-1,0				320-500	300	6,7-6,9	580	2,9-3,1
						③a			920	4,8-5,0
									250	8,0

Torque control travel a = - mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ④a	Fuel delivery characteristics ⑤a		Starting fuel delivery Idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
(1) LDA 1250	0,7 bar 149,0-151,0 (147,0-153,0)	1290-1300*	LDA 900	0,7 bar 144,0-146,0 (142,0-148,0)	100	130,0-150,0 (126,0-154,0) =13,0- 13,2 mm RW	-	-
			LDA 500	0 bar 94,0- 96,0 (92,0- 98,0)				

Checking values in brackets

* 1 mm less control rod travel than col. 2
2.84
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Test oil ISO 4113

①

3a

Control rod travel	mm
9	

Testoil-160 4113

500

En

①

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 FIA 13,8 q

1. Edition

En

PE 6 P 120 A 720 RS 3123 RQV 300-900 PA 501-1
Komb.-Nr. 0 401 846 787

Values only apply to test nozzle-and-holder
assembly 1 688 901 019 and fuel-injection test
tubing 1 680 750 067

supersedes -
company: Fiat
engine: 8210.22.105
243 kW

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,5-3,6
(3,45-3,65) mm (from BDG) RW = 9,0 - 12,0 mm

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ / 100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
900	13,2+0,1	21,6-21,8	0,5(0,9)			
300	6,0-6,2	1,5-2,1	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
max.	995	15,2-17,8	-	-	-	ca. 10	100 300	min. 7,6 6,0-6,2	325 550 800 900	1,2-1,4 3,8-4,5 6,6-7,0 7,8
ca. 65	12,2 4,0 1200	940-950 1035-1065 0-1,0				375-490 ③a				

Torque control travel a = - mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational speed limitation intermediate speed	Fuel delivery characteristics		Starting fuel delivery Idle switching point		Torque-control	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
LDA 900	0,9 bar 216,0-218,0 (213,0-221,0)	940-950*	LDA 500	0,9 bar 235,0-241,0 (232,0-244,0)	100	240,0-260,0 (236,0-264,0)		-
			LDA 500	0 bar 143,0-145,0 (140,0-148,0)				

Checking values in brackets

* 1 mm less control rod travel than col. 2

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Testoil 130 413

D. Adjustment Test for Manifold Pressure Compensator

FIA 13,8 q

- 2 -

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution difference mm (1)
PE 6 P.. RS 3123 +RQV.. PA 501-1	0,90	0 0,46 0,32	13,2-13,3 10,0-10,1 12,4-12,5 10,6-11,0

Notes

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 MB 11,0 e 1

1. Edition

En

PE 6 P 120 A 320 LS 3810 RSV 350 - 1150 PO/810
1- 6- 3- 5- 2- 4
0-75-120-195-240-315° + 0,5° (+ 0,75°)

supersedes

company Daimler-Benz
engine OM 421 A
184 KW

Komb.-Nr. 0 401 876 733

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (3,95-4,15) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1130	10,3+0,1	15,5-15,7	0,5 (0,9)			
350	4,7-4,9	1,6- 2,2	0,8 (1,2)			
Values only apply to test nozzle-and-holder assembly 1 688 901 019 and fuel-injection test tubing 1 680 750 067						

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
loose	800	0,3-1,0	-	-	-	ca. 36	350	4,8	-	-
	x = 4,75						100	min. 19,5		
ca. 56	9,3	1175-1185					350	4,7 - 4,9		
	4,0	1250-1270					380-440	= 2,0		
2a								**		

The numbers denote the sequence of the tests Set idle-speed auxiliary spring at 2 mm control-rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop Test oil temp 40°C (104°F)		(6) Rotational-speed limit Note changed to) rev/min		(3a) Fuel delivery characteristics rev/min		Starting fuel delivery Idle		(5)		(4a) Idle stop Control rod travel mm	
rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min			
1	2	3	4	5		6	7	8			9
1130	155,0 - 157,0 (152,0 - 160,0)	1175-1185*	-	-		100	140,0-160,0 (136,0-164,0)	-			-

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.84

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Test specifications

Fuel injection pumps and governors

WPP 001/4 MTU 19,9 a 1

En.

2. Edition

PE 6 ZW 150/120 RS 70/11 RQU 250-350/1100 ZWA 46 DR

Komb.-Nr. 0 402 436 033

1- 2- 3 - 4 - 5 - 6

0-45-120-165-240-285° ± 0,5° (± 0,75°)

Replaces 11.83

Firm: MTU

Engine: MB 6 V 331

Note VDT-W-Gen./7

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

Port closing at prestroke 2,50-2,60 mm (from BDC) 2,45-2,65 mm (from BDC) 1. 6

Rotational speed min ⁻¹	Control-rod travel mm	Fuel delivery Average value cm ³ /1000 strokes	Difference in fuel delivery cm ³ /1000 strokes	Fuel delivery Checking values cm ³ /1000 strokes	Spring pre-tension (torque-control valve)
1	2	3	4	5	
1000	18,0	497,0-507,0	15,0 (22,0)	494,0-510,0	-
600	9,0	125,0-145,0	16,0 (24,0)	120,0-150,0	
300	9,0	37,0-57,0	10,0 (15,0)	33,0-61,0	
1100		C Sp. 2	12,0		
350		C Sp. 5			

Adjust the fuel delivery from each outlet according to the values in

B. Governor settings

Upper rated speed			Medium rated speed			Lower rated speed			Torque control	
Control lever deflection degrees	mm	Control-rod travel mm	Control lever deflection degrees	mm	Control-rod travel mm	Control lever deflection degrees	mm	Control-rod travel mm	Control-rod travel mm	
1	2	3	4	5	6	7	8	9	10	11
Ca. 58	650	18,0	Ca. 27	150	14,1-16,4	Ca. 21	150	11,1-13,2	-	-
	1100	17,5-18,0		220	10,2-11,8		220	8,0-8,7		
	1150	11,7-16,0		350	7,4-7,6		250	7,6-7,8		
	1200	3,0-10,0		500	2,0-2,7		400	2,7-4,5		
	1280	0-1,0		650	2,0		520	0		
				1000	1,8-2,0					
				1160	0					

Torque control travel a = - mm Speed regulation: At 1130-1140 min⁻¹ less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°)		Control rod stop at speed	Fuel-delivery characteristics		Starting fuel delivery	
min ⁻¹	cm ³ /1000 strokes	min ⁻¹	min	cm ³ /1000 strokes	min	cm ³ /1000 strokes
1	2	3	4	5	6	7
1100	279,0-285,0 (276,0-288,0)	-	350	42,0-48,0	100	17,8-18,2 mm RW (17,5-18,5)
						Shutoff solenoid 0,5 - 1,5 mm in front of stop

Checking values in brackets

03.84

Testoil-ISO 4113

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Test specifications

Fuel injection pumps and governors

WPP 001/4 MTU 26,5 g

2. Edition

En.

PE 8 ZW 150/120 RS 74/11 RQU 250-350/1100 ZWA 46 DR
Komb. Nr. 0 402 438 011

Replaces 11.83
Firm: MTU
Engine MB 8 V 331

1 - 2 - 6 - 3 - 4 - 5 - 7 - 8 je $45^\circ \pm 0,5^\circ (\pm 0,75^\circ)$

Note VDT-W-Gen./7

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

Port closing at prestroke 2,50-2,60 (2,45-2,65) mm (from BDC) 1. 8

Rotational speed min ⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm ³ /1000 strokes 3	Difference in fuel delivery cm ³ /1000 strokes 4	Fuel delivery Checking values cm ³ /1000 strokes 5	Spring pre-tension (torque-control valve)
1000	18,0	497,0-507,0	15,0 (22,0)	494,0-510,0	
600	9,0	125,0-145,0	16,0 (24,0)	120,0-150,0	
300	9,0	37,0-57,0	10,0 (15,0)	33,0-61,0	
1100		C Sp 2			
350		C Sp 5	12,0		

Adjust the fuel delivery from each outlet according to the values in

B. Governor settings

Upper rated speed			Medium rated speed			Lower rated speed			Torque control	
Control lever deflection degrees 1	mm min ⁻¹ 2	Control-rod travel mm min ⁻¹ 3	Control lever deflection degrees 4	mm min ⁻¹ 5	Control-rod travel mm min ⁻¹ 6	Control lever deflection degrees 7	mm min ⁻¹ 8	Control-rod travel mm min ⁻¹ 9	mm min ⁻¹ 10	Control-rod travel mm min ⁻¹ 11
ca. 58	650 1100 1150 1200 1280	18,0 17,5-18,0 11,7-16,0 3,0-10,0 0 - 1,0	ca. 27	150 220 350 500 650 1000	14,1-16,4 10,2-11,8 7,4-7,6 2,0-2,7 2,0 1,8-2,0	ca. 21	150 220 250 400 520	11,1-13,2 8,0-8,7 7,6-7,8 2,7-4,5 0	-	-

Torque control travel a = mm Speed regulation: At 1130-1140 min⁻¹ less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°)		Control rod stop at speed	Fuel-delivery characteristics		Starting fuel delivery	
min ⁻¹ 1	cm ³ /1000 strokes 2	min ⁻¹ 3	min ⁻¹ 4	cm ³ /1000 strokes 5	min ⁻¹ 6	cm ³ /1000 strokes 7
1100	279,0-285,0 (276,0-288,0)	-	350	42,0-48,0	100	17,8-18,2 mm RW (17,5-18,5)
						Shutoff solenoid 0,5 - 1,5 mm in front of stop

Checking values in brackets

03.84

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Testoil-ISO 4113

Test specifications

Fuel injection pumps and governors

WPP 001/4 MTU 19,9 b

6. Edition

En.

PE 6 ZW 150/120 RS 1001/11 RQUV 300-1200 ZWA 48 R

Replaces 1.83

Komb.-Nr. 0 402 436 038

Firm. MTU

1 - 2 - 3 - 4 - 5 - 6

Engine: MB 6 V 331

0 - 45-120-165-240-285⁰ ± 0,5⁰ (±0,75⁰)

Note VDT-W-Gen./7

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

Testoil-ISO 4113

Port closing at prestroke ^{2,50-2,60} (2,45-2,65) mm (from BD Zyl. 6)

Rotational speed min ⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm ³ /1000 strokes 3	Difference in fuel delivery cm ³ /1000 strokes 4	Fuel delivery Checking values cm ³ /1000 strokes 5	Spring pre-tension (torque-control valve)
1000	18,0	497,0-507,0	15,0(22,0)	494,0-510,0	-
600	9,0	131,0-151,0	16,0(24,0)	126,0-156,0	
300	9,0	70,0-90,0	10,0(15,0)	65,0-95,0	

Adjust the fuel delivery from each outlet according to the values in

B. Governor settings

Under rated speed			Medium rated speed			Lower rated speed			Torque control	
Control lever deflection degrees 1	mm min ⁻¹ 2	Control-rod travel mm min ⁻¹ 3	Control lever deflection degrees 4	min ⁻¹ 5	Control-rod travel mm 6	Control lever deflection degrees 7	min ⁻¹ 8	Control-rod travel mm 9	min ⁻¹ 10	Control-rod travel mm 11
ca. 85	1200	8,0-21,0	ca. 30	250	12,2-14,6	ca. 23	150	14,3-16,1	-	-
	1250	12,2-16,8		375	6,0-7,2		300	7,3-8,6		
	1300	6,4-11,6		500	2,6-3,7		400	2,8-4,3		
	1350	0,4-6,4		600	0,8-2,1		570	0		
	1420	0 -2,0		730	0					

Torque control travel a = mm Speed regulation: At 1230-1240 min⁻¹ mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°)		Control rod stop at speed		Fuel-delivery characteristics		Starting fuel delivery	
min ⁻¹ 1	cm ³ /1000 strokes 2	min ⁻¹ 3	Idle	min ⁻¹ 4	cm ³ /1000 strokes 5	min ⁻¹ 6	cm ³ /1000 strokes 7
1200	18 mm RW		300 = 8,0 mm RW	-	-	-	Shutoff solenoid 0,5 - 1,5 mm in front of stop

Checking values in brackets

03.84

Test specifications

Fuel injection pumps and governors

WPP 001/4 MTU 26,5 c

2. Edition

En.

PE 8 ZW150/120 RS 1002/11 RQUV 300-1200 ZWA 48 R

1 - 2 - 6 - 3 - 4 - 5 - 7 - 8 je $45^{\circ} \pm 0,5^{\circ} (\pm 0,75^{\circ})$

Note VDT-W-Gen./7

Replaces 11.83

Firm: MTU

Engine MB 8 V 331

Komb.-Nr.

0 402 438 012

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

Port closing at prestroke $(2,45-2,65)$ mm (from BD Cyl. 8)

Rotational speed min ⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm ³ /1000 strokes 3	Difference in fuel delivery cm ³ /1000 strokes 4	Fuel delivery Checking values cm ³ /1000 strokes 5	Spring pre-tension (torque-control valve)
1000	18,0	497,0-507,0	15,0(22,0)	494,0-510,0	-
600	9,0	131,0-151,0	16,0(24,0)	126,0-156,0	
300	9,0	70,0-90,0	10,0(15,0)	65,0-95,0	

Adjust the fuel delivery from each outlet according to the values in

B. Governor settings

Upper rated speed			Medium rated speed			Lower rated speed			Torque control	
Control lever deflection degrees 1	mm min ⁻¹ 2	Control-rod travel mm min ⁻¹ 3	Control lever deflection degrees 4	mm min ⁻¹ 5	Control-rod travel mm 6	Control lever deflection degrees 7	mm min ⁻¹ 8	Control-rod travel mm 9	mm min ⁻¹ 10	mm min ⁻¹ 11
ca. 85	1200	8,0-21,0	ca. 30	250	12,2-14,6	ca. 23	150	14,3-16,1	-	-
	1250	12,2-16,8		375	6,0-7,2		300	7,3-8,6		
	1300	6,4-11,6		500	2,6-3,7		400	2,8-4,3		
	1350	0,4-6,4		600	0,8-2,1		570	0		
	1420	0 -2,0		730	0					

Torque control travel a = mm Speed regulation At 1230-1240 min⁻¹ mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°C)		Control rod stop at speed	Fuel-delivery characteristics		Starting fuel delivery	
min 1	cm ³ /1000 strokes 2	min 3	min 4	cm ³ /1000 strokes 5	min 6	cm ³ /1000 strokes 7
1200	18 mm RW	Leerlauf 300 = 8,0 mm RW	-	-	-	Shutoff solenoid 0,5 - 1,5 mm in front of stop

Checking values in brackets

03.84

BOSCH

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Test specifications

Fuel injection pumps and governors

WPP 001/4 MTU 19,9 c1

2. Edition

En.

PE 6 ZW 150/120 RS 1007/11 RQU 250-400/1100 ZWA 49 R
 Komb.-Nr. 0 402 436 043
 1 - 2 - 3 - 4 - 5 - 6
 0 - 45-120-165-240-285⁰ $\pm 0,5^0$ ($\pm 0,75^0$)

Replaces 11.83

Firm: MTU

Engine MB 6 V 331

Note VDT-W-Gen./7

Governor adjustment according to VDT-I-420/112

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

Port closing at prestroke $2,50-2,60$ mm (from BDC) Zyl. 6
 $(2,45-2,65)$

Rotational speed min ⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm ³ /1000 strokes 3	Difference in fuel delivery cm ³ /1000 strokes 4	Fuel delivery Checking values cm ³ /1000 strokes 5	Spring pre-tension (torque-control valve)
1000	18,0	497,0-507,0	15,0(22,0)	494,0-510,0	-
600	9,0	131,0-151,0	16,0(24,0)	126,0-156,0	
300	9,0	70,0-90,0	10,0(15,0)	65,0-95,0	

Adjust the fuel delivery from each outlet according to the values in

B. Governor settings

Upper rated speed			Medium rated speed			Lower rated speed			Torque control	
Control lever deflection degrees 1	mm min ⁻¹ 2	Control-rod travel mm min ⁻¹ 3	Control lever deflection degrees 4	mm min ⁻¹ 5	Control-rod travel mm min ⁻¹ 6	Control lever deflection degrees 7	mm min ⁻¹ 8	Control-rod travel mm min ⁻¹ 9	mm min ⁻¹ 10	Control-rod travel mm min ⁻¹ 11
ca. 58	700	18,0-18,5	ca. 22	150	15,0-18,0	ca. 13	150	9,8-11,9	-	-
	1125	17,6-18,0		400	7,8-8,8		250	7,8-8,2		
	1150	12,0-17,0		700	1,8-2,4		400	2,3-4,5		
	1200	0 - 7,5		1100	1,8-2,4		530	0		
	1300	0 - 1,0		1160	0					

Torque control travel a = mm Speed regulation: At 1130-1140 min⁻¹ less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°C)		Control rod stop at speed		Fuel-delivery characteristics		Starting fuel delivery	
min 1	cm ³ /1000 strokes 2	min 3	Idle	min 4	cm ³ /1000 strokes 5	min 6	cm ³ /1000 strokes 7
1100	18 mm RW		300 = 8,0 mm RW	-	-	100	18,0-18,2 mm RW
							Shutoff solenoid 0,5 - 1,5 mm in front of stop

Checking values in brackets

03.84

Test specifications

Fuel injection pumps and governors

WPP 001/4 MTU 39,7 e

2. Edition

En.

PE 12 ZW 150/120 RS 1008/11 RQUV 300-1200 ZWA 50 R
 Komb.-Nr. 0 402 430 003
 1-12-9-4-5-8-11-2-3-10-7-6
 0-45-60-105-120-165-180-225-240-285-300-345° ± 0,5° (±0,75°)

Replaces 11.83
 Firm: MTU
 Engine: MB 12 V 331

Note VDT-W-Gen./7

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

Port closing at prestroke 2,50-2,60 mm (from BDC) Zyl. 12
 (2,45-2,65)

Rotational speed min 1	Control-rod travel mm 2	Fuel delivery Average value cm ³ /1000 strokes 3	Difference in fuel delivery cm ³ /1000 strokes 4	Fuel delivery Checking values cm ³ /1000 strokes 5	Spring pre-tension (torque-control valve)
1000	18,0	497,0-507,0	15,0 (22,0)	494,0-510,0	-
600	9,0	131,0-151,0	16,0 (24,0)	126,0-156,0	
300	9,0	70,0-90,0	10,0 (15,0)	65,0-95,0	

Adjust the fuel delivery from each outlet according to the values in

B. Governor settings

Upper rated speed			Medium rated speed			Lower rated speed			Torque control	
Control lever deflection degrees 1	mm min 2	Control-rod travel mm min 3	Control lever deflection degrees 4	mm min 5	Control-rod travel mm min 6	Control lever deflection degrees 7	mm min 8	Control-rod travel mm min 9	mm min 10	Control-rod travel mm min 11
ca. 85	1200	8,0-21,0	ca. 30	250	12,2-14,6	ca. 23	150	14,3-16,1	-	-
	1250	12,2-16,8		375	6,0-7,2		300	7,3-8,6		
	1300	6,4-11,6		500	2,6-3,7		400	2,8-4,3		
	1350	0,4-6,4		600	0,8-2,1		570	0		
	1420	0-2,0		730	0					

Torque control travel a = mm Speed regulation: At 1230-1240 min⁻¹ less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°)		Control rod stop at speed		Fuel-delivery characteristics		Starting fuel delivery	
min 1	cm ³ /1000 strokes 2	min 3	Idle	min 4	cm ³ /1000 strokes 5	min 6	cm ³ /1000 strokes 7
1200	18 mm RW	300	= 8,0 mm RW	-	-	-	Shutoff solenoid 0,5 - 1,5 mm in front of stop

Checking values in brackets

03.84

BOSCH

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Testoil-ISO 4113

K1

K1

Test specifications

Fuel injection pumps and governors

WPP 001/4 MTU 39,7 e 1

En.

2. Edition

PE 12 ZW 150/120 RS 1008/11 RQUV 300-1200 ZWA 55 R
 1-12- 9- 4 - 5 - 8 - 11- 2 - 3 - 10- 7 - 6
 0-45-60-105-120-165-180-225-240-285-300-345° $\pm 0,5^\circ$ ($\pm 0,75^\circ$)
 Note VDT-W-Gen./7

Replaces 11.93
 Firm: MTU
 Engine: MB 12 V 331
 Komb.-Nr.
 0 402 430 002

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

Port closing at prestroke 2,50-2,60 mm (from BDC) $\pm 0,12$
 (2,45-2,65)

Rotational speed min ⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm ³ /1000 strokes 3	Difference in fuel delivery cm ³ /1000 strokes 4	Fuel delivery Checking values cm ³ /1000 strokes 5	Spring pre-tension (torque-control valve)
1000	18,0	497,0-507,0	15,0 (22,0)	494,0-510,0	-
600	9,0	131,0-151,0	16,0 (24,0)	126,0-156,0	
300	9,0	70,0-90,0	10,0 (15,0)	65,0-95,0	

Adjust the fuel delivery from each outlet according to the values in

B. Governor settings

Upper rated speed			Medium rated speed			Lower rated speed			Torque control	
Control lever deflection degrees 1	mm min ⁻¹ 2	Control-rod travel mm min ⁻¹ 3	Control lever deflection degrees 4	mm min ⁻¹ 5	Control-rod travel mm min ⁻¹ 6	Control lever deflection degrees 7	mm min ⁻¹ 8	Control-rod travel mm min ⁻¹ 9	mm min ⁻¹ 10	mm min ⁻¹ 11
ca. 85	1200	18,0-21,0	ca. 30	250	12,2-14,6	ca. 23	150	14,3-16,1	-	-
	1250	12,2-16,8		375	6,0-7,2		300	7,3-8,6		
	1300	6,4-11,6		500	2,6-3,7		400	2,8-4,3		
	1350	0,4-6,4		600	0,8-2,1		570	0		
	1420	0-2,0		730	0					

Torque control travel a = mm Speed regulation: At 1230-1240 min⁻¹ less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°)		Control rod stop at speed	Fuel-delivery characteristics		Starting fuel delivery	
min ⁻¹ 1	cm ³ /1000 strokes 2	min ⁻¹ 3	min ⁻¹ 4	cm ³ /1000 strokes 5	min ⁻¹ 6	cm ³ /1000 strokes 7
1200	18 mm RW	300 = 8,0 mm RW	-		-	Shutoff solenoid 0,5 - 1,5 mm in front of stop

Checking values in brackets

03.84

BOSCH

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Testoil-ISO 4113

Test specifications

Fuel injection pumps and governors

WPP 001/4 MTU 26,5 e 1

2. Edition

En.

PE 8 ZW 150/120 RS 1009/11 RQU 250-400/1100 ZWA 49 R

Komb.-Nr. 0 402 438 015

1 - 2 - 6 - 3 - 4 - 5 - 7 - 8 je $45^\circ \pm 0,5^\circ (\pm 0,75^\circ)$

Note VDT-W-Gen./7

Governor adjustment according to VDT-I-420/112

Replaces 11.83

Firm: MTU

Engine: MB 8 V 331

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

Port closing at prestroke $2,50-2,60$ mm (from BDC) $(2,45-2,65)$ $Zyl. 8$

Rotational speed min ⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm ³ /1000 strokes 3	Difference in fuel delivery cm ³ /1000 strokes 4	Fuel delivery Checking values cm ³ /1000 strokes 5	Spring pre-tension (torque-control valve)
1000	18,0	497,0-507,0	15,0 (22,0)	494,0-510,0	-
600	9,0	131,0-151,0	16,0 (24,0)	126,0-156,0	
300	9,0	70,0-90,0	10,0 (15,0)	65,0-95,0	

Adjust the fuel delivery from each outlet according to the values in

B. Governor settings

Upper rated speed			Medium rated speed			Lower rated speed			Torque control	
Control lever deflection degrees 1	mm min ⁻¹ 2	Control-rod travel mm min ⁻¹ 3	Control lever deflection degrees 4	mm min ⁻¹ 5	Control-rod travel mm 6	Control lever deflection degrees 7	mm min ⁻¹ 8	Control-rod travel mm 9	mm min ⁻¹ 10	Control-rod travel mm 11
ca.58	700	18,0-18,5	ca.22	150	15,0-18,0	ca.13	150	9,8-11,9	-	-
	1125	17,6-18,0		400	7,8-8,8		250	7,8-8,2		
	1150	12,0-17,0		700	1,8-2,4		400	2,3-4,5		
	1200	0-7,5		1100	1,8-2,4		530	0		
	1300	0-1,0		1160	0					

Torque control travel a = - mm Speed regulation: At 1130-1140 min⁻¹ less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°)		Control rod stop at speed		Fuel-delivery characteristics		Starting fuel delivery	
min ⁻¹ 1	cm ³ /1000 strokes 2	min ⁻¹ 3	Leerlauf	min ⁻¹ 4	cm ³ /1000 strokes 5	min ⁻¹ 6	cm ³ /1000 strokes 7
1100	18 mm RW	300	= 8,0 mm RW	-	-	100	18,0-18,2 mm RW
							Shutoff solenoid 0,5 - 1,5 mm in front of stop

Checking values in brackets

03.94

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Testoil-ISO 4113

Test specifications

Fuel injection pumps

and governors

WPP 001/4 MTU 26,5 e

2. Edition

En.

PE 8 ZW 150/120 RS 1009/11 RQUV 300-1200 ZWA 50 R
 Komb.-Nr. 0 402 438 014
 1 - 2 - 6 - 3 - 4 - 5 - 7 - 8 je $45^\circ \pm 0,5^\circ (\pm 0,75^\circ)$
 Note VDT-W-Gen./7

Replaces 1.83

Firm: MTU

Engine MB 8 V 331

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection pump settings

Port closing at prestroke $\overset{2,50-2,60}{(2,45-2,65)}$ mm (from BDC) $\overset{1}{\text{Cyl. 8}}$

Rotational speed min ⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm ³ /1000 strokes 3	Difference in fuel delivery cm ³ /1000 strokes 4	Fuel delivery Checking values cm ³ /1000 strokes 5	Spring pre-tension (torque-control valve)
1000	18,0	497,0-507,0	15,0 (22,0)	494,0-510,0	-
600	9,0	131,0-151,0	16,0 (24,0)	126,0-156,0	
300	9,0	70,0-90,0	10,0 (15,0)	65,0-95,0	

Adjust the fuel delivery from each outlet according to the values in

B. Governor settings

Upper rated speed			Medium rated speed			Lower rated speed			Torque control	
Control lever deflection degrees 1	mm min ⁻¹ 2	Control-rod travel mm min ⁻¹ 3	Control lever deflection degrees 4	mm min ⁻¹ 5	Control-rod travel mm 6	Control lever deflection degrees 7	mm min ⁻¹ 8	Control-rod travel mm 9	min ⁻¹ 10	Control-rod travel mm 11
Ca. 85	1200	18,0-21,0	ca. 30	250	12,2-14,6	ca. 23	150	14,3-16,1	-	-
	1250	12,2-16,8		375	6,0-7,2		300	7,3-8,6		
	1300	6,4-11,6		500	2,6-3,7		400	2,8-4,3		
	1350	0,4-6,4		600	0,8-2,1		570	0		
	1420	0-2,0		730	0					

Torque control travel a = mm Speed regulation: At 1130-1140 min⁻¹ 1 mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°)		Control rod stop at speed	Fuel-delivery characteristics		Starting fuel delivery	
min 1	cm ³ /1000 strokes 2	min 3	min 4	cm ³ /1000 strokes 5	min 6	cm ³ /1000 strokes 7
1200	18 mm RW	300 = 8,0 mm RW	-	-	-	Shutoff solenoid 0,5 - 1,5 mm in front of stop

Checking values in brackets

03.84

Testoil-ISO 4113

Test specifications

Fuel injection pumps and governors

WPP 001/4 MTU 23,8 a

6. Edition

En.

PE 6 ZW 160/120 RS 1012/11 RQUV 300-900 ZWA 51 R

1 - 2 - 3 - 4 - 5 - 6
 0 -45 -120-165-240-285° ± 0,5° (±0,75°)

Note VDT-W-Gen./7

Replaces 11.83

Firm: MTU

Engine MT 6 V 396

Komb.-Nr.

0 402 436 053

Testoil-ISO 4113

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

Port closing at prestroke (2,50-26,0 mm (from BDC) Zyl. 6
 (2,45-2,65)

Rotational speed min ⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm ³ /1000 strokes 3	Difference in fuel delivery cm ³ /1000 strokes 4	Fuel delivery Checking values cm ³ /1000 strokes 5	Spring pre-tension (torque-control valve)
600	18,0	513,0-523,0	16,0 (24,0)	510,0-526,0	-
600	9,0	140,0-160,0	12,0 (18,0)	135,0-165,0	
300	9,0	72,0-92,0	11,0 (16,0)	67,0-97,0	

Adjust the fuel delivery from each outlet according to the values in

B. Governor settings

Sleeve position 49,5 mm

Upper rated speed			Medium rated speed			Lower rated speed			Torque control	
Control lever deflection degrees 1	mm min ⁻¹ 2	Control-rod travel mm min ⁻¹ 3	Control lever deflection degrees 4	mm min ⁻¹ 5	Control-rod travel mm min ⁻¹ 6	Control lever deflection degrees 7	mm min ⁻¹ 8	Control-rod travel mm min ⁻¹ 9	mm min ⁻¹ 10	Control-rod travel mm min ⁻¹ 11
ca. 85	920 950 1020 1090	18,0-21,5 14,4-18,6 4,0-10,2 0-2,0	ca. 30	200 300 375 500 630	13,0-15,0 10,0-11,5 8,0 2,5-4,2 0	ca. 23	100 300 450 570	14,2-16,0 8,0 1,6-3,7 0	-	-

Torque control travel a = mm

Speed regulation: At 910-915 min⁻¹ 1 mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°)		Control rod stop at speed	Fuel-delivery characteristics		Starting fuel delivery	
min ⁻¹ 1	cm ³ /1000 strokes 2	min ⁻¹ 3	min ⁻¹ 4	cm ³ /1000 strokes 5	min ⁻¹ 6	cm ³ /1000 strokes 7
900	18 mm RW	Idle 300 = 8 mm RW	-	-	-	-

Checking values in brackets

03.84

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Test specifications

Fuel injection pumps and governors

WPP 001/4 MTU 23,8 b

2. Edition

En.

PE 6 ZW 160/120 RS 1012/11 RQUV 750 ZWA 53 R

 1 - 2 - 3 - 4 - 5 - 6
 0 -45 -120-165-240-285° $\pm 0,5^\circ$ ($\pm 0,75^\circ$)

Note VDT-W-Gen./7

Replaces 11.83

Firm:

MTU

Engine MT 6 V 396

Komb.-Nr.

0 402 436 054

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

 Port closing at prestroke $\frac{2,50-2,60}{(2,45-2,65)}$ mm (from BDC) Zyl. 6

Rotational speed min ⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm ³ /1000 strokes 3	Difference in fuel delivery cm ³ /1000 strokes 4	Fuel delivery Checking values cm ³ /1000 strokes 5	Spring pre-tension (torque-control valve)
600	18,0	513,0-523,0	16,0 (24,0)	510,0-526,0	-
600	9,0	140,0-160,0	12,0 (18,0)	135,0-165,0	
300	9,0	72,0-92,0	11,0 (16,0)	67,0-97,0	

Adjust the fuel delivery from each outlet according to the values in

B. Governor settings

Sleeve position 49,5 mm

Upper rated speed			Medium rated speed			Lower rated speed			Torque control	
Control lever deflection degrees 1	mm min ⁻¹ 2	Control-rod travel mm min ⁻¹ 3	Control lever deflection degrees 4	mm min ⁻¹ 5	Control-rod travel mm min ⁻¹ 6	Control lever deflection degrees 7	mm min ⁻¹ 8	Control-rod travel mm min ⁻¹ 9	mm min ⁻¹ 10	Control-rod travel mm min ⁻¹ 11
ca. 69	750	18,0	-	-	-	-	-	-	-	-
	770	9,6-11,8								
	790	1,4-5,2								
	810	0								

Torque control travel a = mm Speed regulation: At 760-765 min⁻¹ less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°)		Control rod stop at speed	Fuel-delivery characteristics		Starting fuel delivery	
min ⁻¹ 1	cm ³ /1000 strokes 2	min ⁻¹ 3 Leerlaufanschl.	min ⁻¹ 4	cm ³ /1000 strokes 5	min ⁻¹ 6	cm ³ /1000 strokes 7
750	18 mm RW	12 mm RW	-	-	-	-

Checking values in brackets

03.84

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Test specifications

Fuel injection pumps and governors

WPP 001/4 MTU 23,8 c

2. Edition

En.

PE 6 ZW 160/120 RS 1012/11 RQUV 900 ZWA 53 R

1 - 2 - 3 - 4 - 5 - 6
0 -45 -120-165-240-285 \pm 0,5° (\pm 0,75°)

Note VDT-W-Gen./7

Replaces 1.83

Firm: MTU

Engine: MT 6 V 396

Komb.-Nr.

0 02 436 048

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

Testoil-ISO 4113

A. Fuel-injection-pump settings

Port closing at prestroke $\begin{matrix} 2,50-2,60 \\ (2,45-2,65) \end{matrix}$ mm (from BDC) Zyl. 6

Rotational speed min ⁻¹	Control-rod travel mm	Fuel delivery Average value cm ³ /1000 strokes	Difference in fuel delivery cm ³ /1000 strokes	Fuel delivery Checking values cm ³ /1000 strokes	Spring pre-tension (torque-control valve)
1	2	3	4	5	
600	18,0	513,0-523,0	16,0 (24,0)	510,0-526,0	-
600	9,0	140,0-160,0	12,0 (18,0)	135,0-165,0	
300	9,0	72,0-92,0	11,0 (16,0)	67,0-97,0	

Adjust the fuel delivery from each outlet according to the values in

B. Governor settings

Sleeve position 49,5 mm

Upper rated speed			Medium rated speed			Lower rated speed			Torque control	
Control lever deflection degrees	mm min ⁻¹	Control-rod travel mm min ⁻¹	Control lever deflection degrees	min ⁻¹	Control-rod travel mm	Control lever deflection degrees	min ⁻¹	Control-rod travel mm	min ⁻¹	Control-rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca. 70	900	18,0	-	-	-	-	-	-	-	-
	920	11,1-12,0								
	940	1,4-5,6								
	965	0								

Torque control travel a = mmSpeed regulation: At 910-915 min⁻¹ 1 mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°)		Control rod stop at speed	Fuel-delivery characteristics		Starting fuel delivery	
min ⁻¹	cm ³ /1000 strokes	min ⁻¹ idle stop	min ⁻¹	cm ³ /1000 strokes	min ⁻¹	cm ³ /1000 strokes
1	2	3	4	5	6	7
900	18 mm RW	12 mm RW	-	-	-	-

Checking values in brackets

03.84

Test specifications

Fuel injection pumps and governors

WPP 001/4 MTU 23,8 f

En.

2. Edition

PE 6 ZW 160/120 RS 1012/11 RQU 750 ZWA 56 R

1 -2- 3- 4- 5- 6

0-45-120-165-240-285° -⁺ 0,5° ([±] 0,75°)

Note VDT-W-Gen./7

Replaces 11.83

Firm: MTU

Engine MT 6 V 396

Komb.-Nr.

0 402 436 045

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

Port closing at prestroke $\begin{matrix} 2,50-2,60 \\ (2,45-2,65) \end{matrix}$ mm (from BD Zyl. 6)

Rotational speed min ⁻¹	Control-rod travel mm	Fuel delivery Average value cm ³ /1000 strokes	Difference in fuel delivery cm ³ /1000 strokes	Fuel delivery Checking values cm ³ /1000 strokes	Spring pre-tension (torque-control valve)
1	2	3	4	5	
600	18,0	513,0-523,0	16,0 (24,0)	510,0-526,0	-
600	9,0	140,0-160,0	12,0 (18,0)	135,0-165,0	
300	9,0	72,0-92,0	11,0 (16,0)	67,0-97,0	

Adjust the fuel delivery from each outlet according to the values in

B. Governor settings

Upper rated speed			Medium rated speed			Lower rated speed			Torque control	
Control lever deflection degrees	mm	Control-rod travel mm	Control lever deflection degrees	mm	Control-rod travel mm	Control lever deflection degrees	mm	Control-rod travel mm	mm	Control-rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca. 52	750	18,0	-	-	-	-	-	-	-	-
	720	25,6-30,6								
	750	17,0-19,0								
	770	6,8-11,8								
	780	0,5-8,0								
	800	0								

Torque control travel a = - mm

Speed regulation: At 760-765 min⁻¹ less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°)		Control rod stop at speed	Fuel-delivery characteristics		Starting fuel delivery	
min ⁻¹	cm ³ /1000 strokes	min ⁻¹	min ⁻¹	cm ³ /1000 strokes	min ⁻¹	cm ³ /1000 strokes
1	2	3	4	5	6	7
750	18 mm RW	12 mm RW	-	-	100	ca. 20 mm RW with starting magnet

Checking values in brackets

03.84

BOSCH

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Test specifications

Fuel injection pumps and governors

WPP 001/4 MTU 23,8 d

2. Edition

En.

PE 6 ZW 160/120 RS 1012/11 RQU 900 ZWA 56 R

1 - 2 - 3 - 4 - 5 - 6
0 -45 -120-165-240-285 $\pm 0,5^\circ$ ($\pm 0,75^\circ$)

Note VDT-W-Gen./7

Replaces 1.83

Firm: MTU

Engine: MT 6 V 396

Komb.-Nr.

0 402 436 046

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

Port closing at prestroke $\frac{2,50-2,60}{(2,45-2,65)}$ mm (from BDC) Zyl. 6

Testoil-ISO 4113

Rotational speed min ⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm ³ /1000 strokes 3	Difference in fuel delivery cm ³ /1000 strokes 4	Fuel delivery Checking values cm ³ /1000 strokes 5	Spring pre-tension (torque-control valve)
600	18,0	513,0-523,0	16,0 (24,0)	510,0-526,0	-
600	9,0	140,0-160,0	12,0 (18,0)	135,0-165,0	
300	9,0	72,0-92,0	11,0 (16,0)	67,0-97,0	

Adjust the fuel delivery from each outlet according to the values in

B. Governor settings

Sleeve position 49,0 mm

Upper rated speed			Medium rated speed			Lower rated speed			Torque control	
Control lever deflection degrees 1	mm min ⁻¹ 2	Control-rod travel mm min ⁻¹ 3	Control lever deflection degrees 4	mm min ⁻¹ 5	Control-rod travel mm min ⁻¹ 6	Control lever deflection degrees 7	mm min ⁻¹ 8	Control-rod travel mm min ⁻¹ 9	mm min ⁻¹ 10	Control-rod travel mm min ⁻¹ 11
ca. 52	900	18,0	-	-	-	-	-	-	-	-
	860	26,8-32,4								
	880	22,3-26,3								
	900	17,0-19,0								
	930	3,7-10,0								
	960	0								

Torque control travel a = mm

Speed regulation: At

1 mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°C)		Control rod stop at speed		Fuel-delivery characteristics		Starting fuel delivery	
min ⁻¹ 1	cm ³ /1000 strokes 2	min ⁻¹ 3	idle stop	min ⁻¹ 4	cm ³ /1000 strokes 5	min ⁻¹ 6	cm ³ /1000 strokes 7
900	18 mm RW		12 mm RW	-	-	100	ca. 20 mm RW with starting magnet

Checking values in brackets

03.84

BOSCH

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Test specifications

Fuel injection pumps and governors

WPP 001/4 MTU 23,8 e

En.

2. Edition

PE 6 ZW 160/120 RS 1012/11 RQU 750 ZWA 57 R

Komb.-Nr. 0 402 436 047

1- 2- 3- 4- 5- 6

0-45-120-165-240-285° $\pm 0,5^\circ$ ($\pm 0,75^\circ$)

Note VDT-W-Gen./7

Replaces

Firm: 11.83

Engine: MTU

MT 6 V 396

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

Testoil-ISO 4113

Port closing at prestroke		2,50-2,60 (2,45-2,65)	mm (from BDC)	7yl. 6	Spring pre-tension (torque-control valve)
Rotational speed	Control-rod travel	Fuel delivery	Difference in fuel delivery	Fuel delivery	
min ⁻¹	mm	Average value cm ³ /1000 strokes	cm ³ /1000 strokes	Checking values cm ³ /1000 strokes	
1	2	3	4	5	
600	18,0	513,0-523,0	16,0 (24,0)	510,0-526,0	-
600	9,0	140,0-160,0	12,0 (18,0)	135,0-165,0	
300	9,0	72,0-92,0	11,0 (16,0)	67,0-97,0	

Adjust the fuel delivery from each outlet according to the values in

B. Governor settings

Sleeve position 49,0 mm

Upper rated speed			Medium rated speed			Lower rated speed			Torque control	
Control lever deflection degrees	mm	Control-rod travel	Control lever deflection degrees	mm	Control-rod travel	Control lever deflection degrees	mm	Control-rod travel	Control-rod travel	
1	2	3	4	5	6	7	8	9	10	11
ca. 52	750	18,0	-	-	-	-	-	-	-	-
	720	25,6-30,6								
	750	17,0-19,0								
	770	6,8-11,8								
	780	0,5-8,0								
	800	0								

Torque control travel a = - mm

Speed regulation: At 760-765 min⁻¹ mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°)		Control rod stop at speed		Fuel-delivery characteristics		Starting fuel delivery	
min ⁻¹	cm ³ /1000 strokes	min ⁻¹	idle stop	min ⁻¹	cm ³ /1000 strokes	min ⁻¹	cm ³ /1000 strokes
1	2	3		4	5	6	7
750	18 mm RW	12 mm RW		-	-	-	-

Checking values in brackets

03.84

BOSCH

Geschäftsbereich KM Kundendienst Kfz-Ausrüstung
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Test specifications

Fuel injection pumps

and governors

WPP 001/4 MTU 31,7 a

2. Edition

En.

PE 8 ZW 160/ 120 RS 1013/11 RQUV 300-900 ZWA 51 R

1 - 2 - 6 - 3 - 4 - 5 - 7 - 8 je $45^0 \pm 0,5^0$ ($\pm 0,75^0$)

Note VDT-W-Gen./7

Replaces 11.83

Firm: MTU

Engine: MT 8 V 396

Komb.-Nr.

0 402 438 021

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

 Port closing at prestroke $2,50-2,60$ mm (from BDZyl. 8)
 $(2,45-2,65)$

Rotational speed min ⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm ³ /1000 strokes 3	Difference in fuel delivery cm ³ /1000 strokes 4	Fuel delivery Checking values cm ³ /1000 strokes 5	Spring pre-tension (torque-control valve)
600	18,0	513,0-523,0	16,0(24,0)	510,0-526,0	-
600	9,0	140,0-160,0	12,0(18,0)	135,0-165,0	
300	9,0	72,0-92,0	11,0(16,0)	67,0-97,0	

Adjust the fuel delivery from each outlet according to the values in

B. Governor settings

Sleeve position 49,5 mm

Upper rated speed			Medium rated speed			Lower rated speed			Torque control	
Control lever deflection degrees 1	mm min ⁻¹ 2	Control-rod travel mm min ⁻¹ 3	Control lever deflection degrees 4	mm min ⁻¹ 5	Control-rod travel mm min ⁻¹ 6	Control lever deflection degrees 7	mm min ⁻¹ 8	Control-rod travel mm min ⁻¹ 9	mm min ⁻¹ 10	Control-rod travel mm min ⁻¹ 11
ca. 85	920 950 1020 1090	18,0-21,5 14,4-18,6 4,0-10,2 0 - 2,0	ca. 30	200 300 375 500 630	13,0-15,0 10,0-11,5 8,0 2,5-4,2 0	ca. 23	100 300 450 570	14,2-16,0 8,0 1,6-3,7 0	-	-

Torque control travel a = mmSpeed regulation: At 910-915 min⁻¹ less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°C)		Control rod stop at speed		Fuel-delivery characteristics		Starting fuel delivery	
min ⁻¹ 1	cm ³ /1000 strokes 2	min ⁻¹ 3	Idle	min ⁻¹ 4	cm ³ /1000 strokes 5	min ⁻¹ 6	cm ³ /1000 strokes 7
900	18 mm RW	300 = 8 mm RW		-	-	-	-

Checking values in brackets

03.84

Test specifications

Fuel injection pumps and governors

WPP 001/4 MTU 31,7 b

2. Edition

En.

PE 8 ZW 160/ 120 RS 1013/11 RQUV 750 ZWA 53 R

Replaces 11.83

Firm: MTU

Engine: MT 8 V 396

1 - 2 - 6 - 3 - 4 - 5 - 7 - 8 je $45^0 \pm 0,5^0 (\pm 0,75^0)$

Note VDT-W-Gen./7

Kombi-Nr.

0 402 438 022

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

Port closing at prestroke $2,50-2,60$ mm (from BDZ) 1. 8 (2.45-2.65)					
Rotational speed min ⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm ³ /1000 strokes 3	Difference in fuel delivery cm ³ /1000 strokes 4	Fuel delivery Checking values cm ³ /1000 strokes 5	Spring pre-tension (torque-control valve)
600	18,0	513,0-523,0	16,0(24,0)	510,0-526,0	-
600	9,0	140,0-160,0	12,0(18,0)	135,0-165,0	
300	9,0	72,0-92,0	11,0(16,0)	67,0-97,0	

Adjust the fuel delivery from each outlet according to the values in

B. Governor settings

Sleeve position 49,5 mm

Upper rated speed			Medium rated speed			Lower rated speed			Torque control	
Control lever deflection degrees 1	mm min ⁻¹ 2	Control-rod travel mm min ⁻¹ 3	Control lever deflection degrees 4	mm min ⁻¹ 5	Control-rod travel mm min ⁻¹ 6	Control lever deflection degrees 7	mm min ⁻¹ 8	Control-rod travel mm min ⁻¹ 9	mm min ⁻¹ 10	Control-rod travel mm min ⁻¹ 11
ca. 69	750 770 790 810	18,0 9,6-11,8 1,4-5,2 0	-	-	-	-	-	-	-	-

Torque control travel a = mm Speed regulation: At 760-765 min⁻¹ mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°)		Control rod stop at speed		Fuel-delivery characteristics		Starting fuel delivery	
min ⁻¹ 1	cm ³ /1000 strokes 2	min ⁻¹ 3	idle stop	min ⁻¹ 4	cm ³ /1000 strokes 5	min ⁻¹ 6	cm ³ /1000 strokes 7
750	18 mm RW		12 mm RW	-	-	-	-

Checking values in brackets

03.84

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Testoil-ISO 4113

Test specifications

Fuel injection pumps and governors

WPP 001/4 MTU 31,7 c

2. Edition

En.

PE 8 ZW 160/120 RS 1013/11 RQUV 900 ZWA 53 R

Replaces 1.83

Firm: MTU

Engine: MT 8 V 396

1 - 2 - 6 - 3 - 4 - 5 - 7 - 8 je $45^0 \pm 0,5^0 (\pm 0,75^0)$

Note VDT-W-Gen./7

Komb.-Nr.

0 402 438 019

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

Testoil-ISO 4113

 Port closing at prestroke $\begin{matrix} 2,50-2,60 \\ (2,45-2,65) \end{matrix}$ mm (from BD \varnothing 1. 8)

Rotational speed min ⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm ³ /1000 strokes 3	Difference in fuel delivery cm ³ /1000 strokes 4	Fuel delivery Checking values cm ³ /1000 strokes 5	Spring pre-tension (torque-control valve)
600	18,0	513,0-523,0	16,0(24,0)	510,0-526,0	-
600	9,0	140,0-160,0	12,0(18,0)	135,0-165,0	
300	9,0	72,0-92,0	11,0(16,0)	67,0-97,0	

Adjust the fuel delivery from each outlet according to the values in

B. Governor settings

Sleeve position 49,5 mm

Upper rated speed		Control-rod travel		Medium rated speed		Control-rod travel		Lower rated speed		Torque control	
Control lever deflection degrees 1	mm min ⁻¹ 2	mm	min ⁻¹ 3	Control lever deflection degrees 4	min ⁻¹ 5	mm	min ⁻¹ 6	Control lever deflection degrees 7	mm min ⁻¹ 8	mm	mm min ⁻¹ 11
ca. 70	900	18,0	-	-	-	-	-	-	-	-	-
	920	11,1-12,0									
	940	1,4-5,6									
	965	0									

Torque control travel a = mm Speed regulation: At 910-915 min⁻¹ mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°)		Control rod stop at speed	Fuel-delivery characteristics		Starting fuel delivery		
min ⁻¹ 1	cm ³ /1000 strokes 2	min ⁻¹ 3	idle stop	min ⁻¹ 4	cm ³ /1000 strokes 5	min ⁻¹ 6	cm ³ /1000 strokes 7
900	18 mm RW	12 mm RW		-	-	-	-

Checking values in brackets

Test specifications

Fuel injection pumps and governors

WPP 001/4 MTU 31,7 f

2. Edition

En.

PE 8 ZW 160/120 RS 1013/11 RQU 750 ZWA 56 R
 Komb.-Nr. 0 402 438 016
 1 - 2 - 6 - 3 - 4 - 5 - 7 - 8 je $45^0 \pm 0,5^0 (\pm 0,75^0)$

Replaces 1.83

Firm: MTU

Engine: MT 8 V 396

Note VDT-W-Gen./7

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

Port closing at prestroke $2,50-2,60$ mm (from BDZyl. 8)
 (2,45-2,65)

Rotational speed min ⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm ³ /1000 strokes 3	Difference in fuel delivery cm ³ /1000 strokes 4	Fuel delivery Checking values cm ³ /1000 strokes 5	Spring pre-tension (torque-control valve)
600	18,0	513,0-523,0	16,0(24,0)	510,0-526,0	-
600	9,0	140,0-160,0	12,0(18,0)	135,0-165,0	
300	9,0	72,0-92,0	11,0(16,0)	67,0-97,0	

Adjust the fuel delivery from each outlet according to the values in

B. Governor settings

Upper rated speed			Medium rated speed			Lower rated speed			Torque control	
Control lever deflection degrees 1	mm min ⁻¹ 2	Control-rod travel mm min ⁻¹ 3	Control lever deflection degrees 4	mm min ⁻¹ 5	Control-rod travel mm 6	Control lever deflection degrees 7	mm min ⁻¹ 8	Control-rod travel mm 9	mm min ⁻¹ 10	Control-rod travel mm 11
ca. 52	750	18,0	-	-	-	-	-	-	-	-
	720	25,6-30,6								
	750	17,0-19,0								
	770	6,8-11,8								
	780	0,5-8,0								
	800	0								

Torque control travel a = - mm Speed regulation: At 760-765 min⁻¹ less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°)		Control rod stop at speed	Fuel-delivery characteristics		Starting fuel delivery	
min ⁻¹ 1	cm ³ /1000 strokes 2	min ⁻¹ 3	min ⁻¹ 4	cm ³ /1000 strokes 5	min ⁻¹ 6	cm ³ /1000 strokes 7
750	18 mm RW	idle stop 12 mm RW	-	-	100	ca. 20 mm RW with starting magnet

Checking values in brackets

03.84

BOSCH

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Testoil-ISO 4113

Test specifications

Fuel injection pumps and governors

WPP 001/4 MTU 31,7 d

2. Edition

En.

PE 8 ZW 160/120 RS 1013/11 RQU 900 ZWA 56 R

Komb.-Nr. 0 402 438 017

1 - 2 - 6 - 3 - 4 - 5 - 7 - 8 je $45^{\circ} \pm 0,5^{\circ} (\pm 0,75^{\circ})$

Replaces 11.83

Firm: MTU

Engine: MT 8 V 396

Note VDT-W-Gen./7

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

 Port closing at prestroke $\begin{matrix} 2,50-2,60 \\ (2,45-2,65) \end{matrix}$ mm (from BDZyl. 8)

Rotational speed min ⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm ³ /1000 strokes 3	Difference in fuel delivery cm ³ /1000 strokes 4	Fuel delivery Checking values cm ³ /1000 strokes 5	Spring pre-tension (torque-control valve)
600	18,0	513,0-523,0	16,0(24,0)	510,0-526,0	-
600	9,0	140,0-160,0	12,0(18,0)	135,0-165,0	
300	9,0	72,0-92,0	11,0(16,0)	67,0-97,0	

Adjust the fuel delivery from each outlet according to the values in

B. Governor settings

Sleeve position 49,0 mm

Upper rated speed			Medium rated speed			Lower rated speed			Torque control	
Control lever deflection degrees 1	mm min ⁻¹ 2	Control-rod travel mm min ⁻¹ 3	Control lever deflection degrees 4	min ⁻¹ 5	Control-rod travel mm 6	Control lever deflection degrees 7	min ⁻¹ 8	Control-rod travel mm 9	min ⁻¹ 10	Control-rod travel mm 11
ca. 52	900	18,0	-	-	-	-	-	-	-	-
	860	26,8-32,4								
	880	22,3-26,3								
	900	17,0-19,0								
	930	3,7-10,0								
	960	0								

Torque control travel a = - mm

Speed regulation: At 910-915 min⁻¹ mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°C)		Control rod stop at speed		Fuel-delivery characteristics		Starting fuel delivery	
min ⁻¹ 1	cm ³ /1000 strokes 2	min ⁻¹ 3	idle stop	min ⁻¹ 4	cm ³ /1000 strokes 5	min ⁻¹ 6	cm ³ /1000 strokes 7
900	18 mm RW		12 mm RW	-	-	100	ca. 20 mm RW with starting magnet

Checking values in brackets

03.84

Testoil ISO 4113

BOSCH

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Test specifications

Fuel injection pumps and governors

WPP 001/4 MTU 31,7 e

2. Edition

En.

PE 8 ZW 160/120 RS 1013/11 RQU 750 ZWA 57 R

Replaces 11.83

Firm: MTU

Engine: MT 8 V 396

1 - 2 - 6 - 3 - 4 - 5 - 7 - 8 je $45^0 \pm 0,5^0 (\pm 0,75^0)$

Note VDT-W-Gen./7

Komb.-Nr. 0 402 438 018

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

Port closing at prestroke $2,50-2,60$ mm (from BDC) $2,45-2,65$ mm (from BDC) 1. 8

Rotational speed min ⁻¹	Control-rod travel mm	Fuel delivery Average value cm ³ /1000 strokes	Difference in fuel delivery cm ³ /1000 strokes	Fuel delivery Checking values cm ³ /1000 strokes	Spring pre-tension (torque-control valve)
1		3	4	5	
600	18,0	513,0-523,0	16,0(24,0)	510,0-526,0	-
600	9,0	140,0-160,0	12,0(18,0)	135,0-165,0	
300	9,0	72,0-92,0	11,0(16,0)	67,0-97,0	

Adjust the fuel delivery from each outlet according to the values in

B. Governor settings

Sleeve position 49,0 mm

Upper rated speed			Medium rated speed			Lower rated speed			Torque control	
Control lever deflection degrees	mm	Control-rod travel mm	Control lever deflection degrees	mm	Control-rod travel mm	Control lever deflection degrees	mm	Control-rod travel mm	mm	Control-rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca. 52	750	18,0	-	-	-	-	-	-	-	-
	720	25,6-30,6								
	750	17,0-19,0								
	770	6,8-11,8								
	780	0,5-8,0								
	800	0								

Torque control travel a = mmSpeed regulation: At 760-765 min⁻¹ mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°)		Control rod stop at speed	Fuel-delivery characteristics		Starting fuel delivery	
min ⁻¹	cm ³ /1000 strokes	min ⁻¹	min ⁻¹	cm ³ /1000 strokes	min ⁻¹	cm ³ /1000 strokes
1	2	3	4	5	6	7
750	18 mm RW	idle stop	12 mm RW	-	-	-

Checking values in brackets

03.84

Testoil-ISO 4113

Test specifications

Fuel injection pumps and governors

WPP 001/4 MTU 47,5 d

En.

2. Edition

PE 12 ZW 160/120 RS 1015/11 RQUV 300-900 ZWA 51 R

Replace 1.83

Firm MTU

Engine MT 12 V 396

1-12- 9- 4 - 5 - 8 - 11- 2 - 3 - 10- 7 - 6

0-45-60-105-120-165-180-225-240-285-300-345 $\pm 0,5^\circ$ ($\pm 0,75^\circ$)

Komb.-Nr.

0 402 430 006

Note VDT-W-Gen./7

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

Port closing at prestroke 2,50-2,60 mm (from BD) 1. 12
(2,45-2,65)

Rotational speed min ⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm ³ /1000 strokes 3	Difference in fuel delivery cm ³ /1000 strokes 4	Fuel delivery Checking values cm ³ /1000 strokes 5	Spring pre-tension (torque-control valve)
600	18,0	513,0-523,0	16,0 (24,0)	510,0-526,0	-
600	9,0	140,0-160,0	12,0 (18,0)	135,0-165,0	
300	9,0	72,0-92,0	11,0 (16,0)	67,0-97,0	

Adjust the fuel delivery from each outlet according to the values in

B. Governor settings

Sleeve position 49,5 mm

Upper rated speed			Medium rated speed			Lower rated speed			Torque control	
Control lever deflection degrees 1	mm min ⁻¹ 2	Control-rod travel mm min ⁻¹ 3	Control lever deflection degrees 4	mm min ⁻¹ 5	Control-rod travel mm min ⁻¹ 6	Control lever deflection degrees 7	mm min ⁻¹ 8	Control-rod travel mm min ⁻¹ 9	mm min ⁻¹ 10	mm min ⁻¹ 11
ca. 85	920 950 1020 1090	18,0-21,5 14,4-18,6 4,0-10,2 0-2,0	ca. 30	200 300 375 500 630	13,0-15,0 10,0-11,5 8,0 2,5-4,2 0	ca. 23	100 300 450 570	14,2-16,0 8,0 1,6-3,7 0	-	-

Torque control travel a = - mm

Speed regulation: At 910-915 min⁻¹ mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°)		Control rod stop at speed	Fuel-delivery characteristics		Starting fuel delivery	
min ⁻¹ 1	cm ³ /1000 strokes 2	min ⁻¹ 3	min ⁻¹ 4	cm ³ /1000 strokes 5	min ⁻¹ 6	cm ³ /1000 strokes 7
900	18 mm RW	Idle 300 = 8 mm RW	-	-	-	-

Checking values in brackets

03.84

K17

BOSCH

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K17

Test specifications

Fuel injection pumps and governors

WPP 001/4 MTU 47,5 e

En.

2. Edition

PE 12 ZW 160/120 RS 1015/11 RQUV 750 ZWA 53 R

1-12- 9- 4 - 5 - 8 - 11- 2 - 3 - 10- 7 - 6
0-45-60-105-120-165-180-225-240-285-300-345 $\pm 0,5^\circ$ ($\pm 0,75^\circ$)

Note VDT-W-Gen./7

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

Replaces

11.83

Firm: MTU

Engine: MT 12 V 396

Komb.-Nr.

0 402 430 007

A. Fuel-injection-pump settings

Port closing at prestroke $\frac{2,50-2,60}{(2,45-2,65)}$ mm (from BDC) $\frac{2,50-2,60}{(2,45-2,65)}$ mm

Rotational speed min 1	Control-rod travel mm 2	Fuel delivery Average value cm ³ /1000 strokes 3	Difference in fuel delivery cm ³ /1000 strokes 4	Fuel delivery Checking values cm ³ /1000 strokes 5	Spring pre-tension (torque-control valve)
600	18,0	513,0-523,0	16,0 (24,0)	510,0-526,0	-
600	9,0	140,0-160,0	12,0 (18,0)	135,0-165,0	
300	9,0	72,0-92,0	11,0 (16,0)	67,0-97,0	

Adjust the fuel delivery from each outlet according to the values in

B. Governor settings

Sleeve position 49,5 mm

Upper rated speed		Control-rod travel		Medium rated speed		Control-rod travel		Lower rated speed		Control-rod travel		Torque control	
Control lever deflection degrees 1	mm min ⁻¹ 2	mm	min ⁻¹ 3	Control lever deflection degrees 4	min ⁻¹ 5	mm	min ⁻¹ 6	Control lever deflection degrees 7	min ⁻¹ 8	mm	min ⁻¹ 9	mm	min ⁻¹ 11
ca. 69	750	18,0		-	-	-	-	-	-	-	-	-	-
	770 790 810	9,6-11,8 1,4- 5,2 0											

Torque control travel a = - mm

Speed regulation: At 760-765 min⁻¹ less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°)		Control rod stop at speed		Fuel-delivery characteristics		Starting fuel delivery	
min ⁻¹ 1	cm ³ /1000 strokes 2	min ⁻¹ 3	idle stop	min ⁻¹ 4	cm ³ /1000 strokes 5	min ⁻¹ 6	cm ³ /1000 strokes 7
750	18 mm RW	12 mm RW		-	-	-	-

Checking values in brackets

03.84

Testoil-ISO 4113

Test specifications

Fuel injection pumps and governors

WPP 001/4 MTU 47,5 c

En.

3. Edition

PE 12 ZW 160/120 RS 1015/11 RQU 750 ZWA 57 R

Replaces 1.83

Firm: MTU

Engine: MT 12 V 396

1-12- 9- 4 - 5 - 8 - 11- 2 - 3 - 10- 7 - 6
0-45-60-105-120-165-180-225-240-285-300-345 $\pm 0,5^\circ$ ($\pm 0,75^\circ$)

Komb.-Nr.

0 402 430 005

Note VDT-W-Gen./7

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

Port closing at prestroke $\begin{matrix} 2,50-2,60 \\ (2,45-2,65) \end{matrix}$ mm (from BDC) 1. 12

Rotational speed min ⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm ³ /1000 strokes 3	Difference in fuel delivery cm ³ /1000 strokes 4	Fuel delivery Checking values cm ³ /1000 strokes 5	Spring pre-tension (torque-control valve) 6
600	18,0	513,0-523,0	16,0 (24,0)	510,0-526,0	-
600	9,0	140,0-160,0	12,0 (18,0)	135,0-165,0	
300	9,0	72,0-92,0	11,0 (16,0)	67,0-97,0	

Adjust the fuel delivery from each outlet according to the values in

B. Governor settings

Sleeve position 49,0 mm.

Upper rated speed			Medium rated speed			Lower rated speed			Torque control	
Control lever deflection degrees 1	mm min ⁻¹ 2	Control-rod travel mm min ⁻¹ 3	Control lever deflection degrees 4	mm min ⁻¹ 5	Control-rod travel mm min ⁻¹ 6	Control lever deflection degrees 7	mm min ⁻¹ 8	Control-rod travel mm min ⁻¹ 9	mm min ⁻¹ 10	Control-rod travel mm min ⁻¹ 11
ca. 52	750	18,0	-	-	-	-	-	-	-	-
	720	25,6-30,6								
	750	17,0-19,0								
	770	6,8-11,8								
	780	0,5-8,0								
	800	0								

Torque control travel a = - mm

Speed regulation: At 760-765 min⁻¹ mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°)		Control rod stop at speed	Fuel-delivery characteristics		Starting fuel delivery	
min ⁻¹ 1	cm ³ /1000 strokes 2	min 3	min 4	cm ³ /1000 strokes 5	min 6	cm ³ /1000 strokes 7
750	18 mm RW	idle stop 12 mm RW	-	-	-	-

Checking values in brackets

03.84

Testoil-ISO 4113

Test specifications

Fuel injection pumps and governors

WPP 001/4 MTU 26,5 d

En.

2. Edition

PE 8 ZW 150/120 RS 1019/11 RQUV 300-1200 ZWA 51 R

Komb.-Nr. 0 402 438 020

1 - 2 - 6 - 3 - 4 - 5 - 7 - 8 je $45^\circ \pm 0,5^\circ (\pm 0,75^\circ)$

Note VDT-W-Gen./7

Replaces 1.83

Firm: MTU

Engine: MB 8 V 331

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

Port closing at prestroke $\begin{matrix} 2,50-2,60 \\ (2,45-2,65) \end{matrix}$ mm (from BDC) cyl. 8

Rotational speed min ⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm ³ /1000 strokes 3	Difference in fuel delivery cm ³ /1000 strokes 4	Fuel delivery Checking values cm ³ /1000 strokes 5	Spring pre-tension (torque-control valve)
1000	18,0	497,0-507,0	15,0 (22,0)	494,0-510,0	-
600	9,0	131,0-151,0	16,0 (24,0)	126,0-156,0	
300	9,0	70,0-90,0	10,0 (15,0)	65,0-95,0	

Adjust the fuel delivery from each outlet according to the values in

B. Governor settings

Upper rated speed			Medium rated speed			Lower rated speed			Torque control	
Control lever deflection degrees 1	mm min ⁻¹ 2	Control-rod travel mm min ⁻¹ 3	Control lever deflection degrees 4	mm min ⁻¹ 5	Control-rod travel mm min ⁻¹ 6	Control lever deflection degrees 7	mm min ⁻¹ 8	Control-rod travel mm min ⁻¹ 9	mm min ⁻¹ 10	mm min ⁻¹ 11
ca.85	1200	8,0-21,0	ca.30	250	12,2-14,6	ca.23	150	14,3-16,1	-	-
	1250	12,2-16,8		375	6,0-7,2		300	7,3-8,6		
	1300	6,4-11,6		500	2,6-3,7		400	2,8-4,3		
	1350	0,4-6,4		600	0,8-2,1		570	0		
	1420	0-2,0		730	0					

Torque control travel a = - mm

Speed regulation: At 1230-1240 min⁻¹ less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°C)		Control rod stop at speed		Fuel-delivery characteristics		Starting fuel delivery	
min ⁻¹ 1	cm ³ /1000 strokes 2	min ⁻¹ 3	Idle	min ⁻¹ 4	cm ³ /1000 strokes 5	min ⁻¹ 6	cm ³ /1000 strokes 7
1200	18 mm RW	300	= 8,0 mm RW	-	-	-	-

Checking values in brackets

03.84

Testoil-ISO 4113

Test specifications

Fuel injection pumps and governors

WPP 001/4 MTU 19,9 b1

2. Edition

En.

PE 6 ZW 150/120 RS 1021/11 RQUV 300-1200 ZWA 51 R

Replaces 11.83

Komb.-Nr. 0 402 436 052

Firm: MTU

1 - 2 - 3 - 4 - 5 - 6

Engine: MB 6 V 331

0 - 45-120-165-240-285⁰ $\pm 0,5^0$ ($\pm 0,75^0$)

Note VDT-W-Gen./7

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

Port closing at prestroke (2,50-2,60) mm (from BD Zyl. 6)
(2,45-2,65)

Rotational speed min ⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm ³ /1000 strokes 3	Difference in fuel delivery cm ³ /1000 strokes 4	Fuel delivery Checking values cm ³ /1000 strokes 5	Spring pre-tension (torque-control valve)
1000	18,0	497,0-507,0	15,0(22,0)	494,0-510,0	-
600	9,0	131,0-151,0	16,0(24,0)	126,0-156,0	
300	9,0	70,0-90,0	10,0(15,0)	65,0-95,0	

Adjust the fuel delivery from each outlet according to the values in

B. Governor settings

Upper rated speed			Medium rated speed			Lower rated speed			Torque control	
Control lever deflection degrees 1	mm min ⁻¹ 2	Control-rod travel mm min ⁻¹ 3	Control lever deflection degrees 4	mm min ⁻¹ 5	Control-rod travel mm min ⁻¹ 6	Control lever deflection degrees 7	mm min ⁻¹ 8	Control-rod travel mm min ⁻¹ 9	mm min ⁻¹ 10	Control-rod travel mm min ⁻¹ 11
ca. 85	1200	8,0-21,0	ca. 30	250	2,2-14,6	ca. 23	150	14,3-16,1	-	-
	1250	12,2-16,8		375	6,0-7,2		300	7,3-8,6		
	1300	6,4-11,6		500	2,6-3,7		400	2,8-4,3		
	1350	0,4-6,4		600	0,8-2,1		570	0		
	1420	0 -2,0		730	0					

Torque control travel a = mm Speed regulation: At 1230-1240 min⁻¹ 1 mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°)		Control rod stop at speed		Fuel-delivery characteristics		Starting fuel delivery	
min ⁻¹ 1	cm ³ /1000 strokes 2	min ⁻¹ 3	Idle	min ⁻¹ 4	cm ³ /1000 strokes 5	min ⁻¹ 6	cm ³ /1000 strokes 7
1200	18 mm RW	300	= 8,0 mm RW	-	-	-	-

Checking values in brackets

03.84

Testoil-ISO 4113

Test specifications

Fuel injection pumps and governors

WPP U01/4 MTU 29,9 c

10. Edition

En.

PE 8 ZWM 140/120 RS 19/11 RQUV 300-1100 ZWA 40 R
Komb.-Nr. 0 406 038 018

1 - 2 - 6 - 3 - 4 - 5 - 7 - 8 je $45^\circ \pm 0,5^\circ (\pm 0,75^\circ)$

Replaces
Firm 11.83

MTU

Engine MB 837 Ba (660 PS)

Note VDT-W-Gen./7

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

Port closing at prestroke $\begin{matrix} 2,0-2,1 \\ (1,95-2,15) \end{matrix}$ mm (from BDC) $\begin{matrix} 2,0-2,1 \\ (1,95-2,15) \end{matrix}$ mm

Rotational speed min ⁻¹ 1	Control-rod travel mm 2	Fuel delivery Average value cm ³ /1000 strokes 3	Difference in fuel delivery cm ³ /1000 strokes 4	Fuel delivery Checking values cm ³ /1000 strokes 5	Spring pre-tension (torque-control valve)
600	18,0	373,0-378,0	11,0 (16,0)	370,0-381,0	-
600	9,0	143,0-163,0	14,0 (21,0)	138,0-168,0	
200	9,0	71,0-91,0	14,0 (21,0)	66,0-96,0	
1100		C Sp 2	9,0 (13,0)	C Sp 2	
300			8,0 (12,0)		

Adjust the fuel delivery from each outlet according to the values in

B. Governor settings

Upper rated speed			Medium rated speed			Lower rated speed			Torque control	
Control lever deflection degrees 1	mm min ⁻¹ 2	Control-rod travel mm min 3	Control lever deflection degrees 4	mm min 5	Control-rod travel mm 6	Control lever deflection degrees 7	mm min 8	Control-rod travel mm 9	mm min 10	Control-rod travel mm 11
max. 9	1100	15,0-18,2	-	-	-	26	300	6,8-7,5	-	-
	1150	10,4-14,8					120	12,0-14,0		
	1200	4,8-10,8					250	8,0-10,2		
	1250	0-6,8					400	2,8-4,3		
	1330	0					500	0,9-2,9		
							700	0		

Torque control travel a = - mm Speed regulation: At 1130-1145 min⁻¹ less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°)		Control rod stop at speed	Fuel-delivery characteristics		Starting fuel delivery	
min ⁻¹ 1	cm ³ /1000 strokes 2	min 3	min 4	cm ³ /1000 strokes 5	min 6	mm RW 7
1100	323,0-327,0 (320,0-330,0)	-	500	238,0-250,0 (235,0-253,0)	100	18,0-18,2 mm RW
			300	64,0-69,0	1220	RW max. 5 mm

Checking values in brackets

03.84

WPP 001/4 MTU 22,4 c

5. Edition

En.

PE 6 ZWM 140/120 RS 38/11 RQU 425/1100 ZWA 37 DR

Komb.-Nr. 0 406 036 026

1 - 2 - 3 - 4 - 5 - 6

$$0 - 45 - 120 - 165 - 240 - 285^\circ \pm 0,5^\circ (\pm 0,75^\circ)$$

Replaces 11.83

Firm MTU

Engine MB 833 Ea 500

Governor adjustment according to VDI-I-420/112 Note VDT-W-Gen./7

All test specifications apply only to Bosch fuel-injection pump test benches and equipment.

A. Fuel-injection-pump settings

Port closing at prestroke (1.95-2.15) mm (from BDC) 2yl-6

Rotational speed min	Control rod travel mm	Fuel delivery Average value cm ³ /1000 strokes	Difference in fuel delivery cm ³ /1000 strokes	Fuel delivery Checking values cm ³ /1000 strokes	Spring pre-tension (torque control valve)
1	2	3	4	5	
600	18,0	373,0-378,0	11,0 (16,0)	370,0-381,0	-
600	9,0	143,0-163,0	14,0 (21,0)	138,0-168,0	
200	9,0	71,0-91,0	14,0 (21,0)	66,0-96,0	
1080		C. Sp. 2	9,0 (14,0)		
550		C. Sp. 5	11,0 (16,0)		
425			12,0		

Adjust the fuel delivery from each outlet according to the values in

B. Governor settings

Upper rated speed			Medium rated speed			Lower rated speed			Torque control	
Control lever deflection degrees	mm	Control rod travel mm	Control lever deflection degrees	mm	Control rod travel mm	Control lever deflection degrees	mm	Control rod travel mm	min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
max.	600	18,0-18,5	(Position of slider)			ca. 27	600	1,4-1,8	-	-
ca. 58	1100	17,6-18,0					200	17,0-18,0		
	1150	13,6-16,2					350	10,0-14,0		
	1200	9,0-12,4					425	6,0-6,4		
	1250	3,6-8,5					500	2,6-4,2		
	1350	0 - 1,0					1100	1,4-1,8		
							1160	0		

Torque control travel = mm Speed regulation At 1130 min⁻¹ 1mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40 °C)		Control rod stop at speed	Fuel-delivery characteristics		Starting fuel delivery	
min 1	cm 1000 strokes 2	min 3	min 4	idle stop cm 1000 strokes 5	min 6	mm RW xxxxxx 1000 strokes 7
1080	352,0-356,0 (349,0-359,0)	-	550	277,0-295,0 (273,0-299,0)	100	18,0-18,2 mm RW
	Shutoff solenoid 0,5 - 1,5 mm in front of stop		425	Idle 57,0-63,0	High 1220	idle speed RW max. 5 mm

Checking values in brackets

03.84

Test specifications

Fuel injection pumps and governors

WPP 001/4 MTU 29,9 d

3. Edition

En.

PE 8 ZWM 140/120 RS 1018/11 RQU 350-500/1050 ZWA 59 DR
Komb.-Nr. 0 406 038 021
Governor adjustment according to VDT-I-420/112

Replaces 11.83

Firm MTU

Engine MB 837 Ea

537 kW (730 PS)

1 - 2 - 5 - 3 - 4 - 5 - 7 - 8 je 45 ± 0,5 (± 0,75)

Note VDT-W-Gen./7

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

Port closing at prestroke (1,95-2,15) mm from BD Zyl. 8

Rotational speed min	Control-rod travel mm	Fuel delivery Average value cm ³ /1000 strokes	Difference in fuel delivery cm ³ /1000 strokes	Fuel delivery Checking values cm ³ /1000 strokes	Spring pre-tension (torque-control valve)
1	2	3	4	5	
500	18,0	373,0-378,0	11,0 (16,0)	369,0-382,0	-
600	9,0	143,0-163,0	14,0 (21,0)	138,0-168,0	
200	9,0	71,0-91,0	14,0 (21,0)	66,0-96,0	
1050		C, Sp. 2	10,0 (15,0)		
300		C, Sp. 5	9,0		

Adjust the fuel delivery from each outlet according to the values in

B. Governor settings

Upper rated speed			Medium rated speed			Lower rated speed			Torque control	
Control lever deflection degrees	mm	Control-rod travel mm	Control lever deflection degrees	mm	Control-rod travel mm	Control lever deflection degrees	mm	Control-rod travel mm	mm	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca. 62	700	18,0	ca. 43	500	6,6-9,1	ca. 27	300	7,1-8,3	-	-
	1070	17,6-18,0		400	12,0-17,0		100	15,3-18,0		
	1150	9,6-14,0		570	0-4,0		200	12,0-15,7		
	1230	0,4-7,0		660	0		400	1,5-5,2		
	1300	0					520	0		

Torque control travel a = 0 mm

Speed regulation At 1075-1085 min⁻¹ less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°C)		Control rod stop at speed	Speeder XXX characteristic: Leerlauf		Starting fuel delivery	
min 1	cm ³ /1000 strokes 2	min 3	min 4	cm ³ /1000 strokes 5	min 6	cm ³ /1000 strokes 7
1050	358,0-362,0 (355,0-365,0)	-	300	80,0-90,0	100	18,0-18,2 mm RW
					Shutoff solenoid 0,5 - 1,5 mm in front of stop	

Checking values in brackets

03.84

Testoil-ISO 4113

Test specifications

Fuel injection pumps and governors

WPP 001/4 MTU 47,6 c

2. Edition

En.

PEV 12 ZWM 160/120 RS 1030/11 RQU 425-600/1300 ZWA 62-1
Komb.-Nr. 0 406 030 999

Replaces 2.83

Firm: MTU

Engine: MB 873

Note installation and testing instructions KH/VSK 40JP1.

1- 4-10- 7- 5 - 2 - 12- 9 - 3 - 6 - 8 - 11

0-15-60-75-120-135-180-195-240-255-300-315° ± 0,5° (± 0,75°)

Specifications apply to test tubing 1 680 750 059. Please note instructions on

All test specifications apply only to Bosch fuel-injection-pump test benches and equipment sheet 2!

A. Fuel-injection-pump settings

Port closing at prestroke ^{2,5-2,6}
(2,45-2,65) mm (from BDC) ¹²

Rotational speed min ⁻¹	Control-rod travel mm	Fuel delivery Average value cm ³ /1000 strokes	Difference in fuel delivery cm ³ /1000 strokes	Fuel delivery Checking values cm ³ /1000 strokes	Spring pre-tension (torque-control valve)
1	2	3	4	5	
1300	12,0	375,0-385,0	16,0 (24,0)	372,0-388,0	
1300	6,0	113,0-127,0	18,0 (27,0)	110,0-130,0	
425	6,0	31,0-51,0	16,0 (24,0)	27,0-55,0	
1300		C Sp. 2			
425	6,5	C Sp. 5	12,0		

Adjust the fuel delivery from each outlet according to the values in

B. Governor settings

Upper rated speed			Medium rated speed			Lower rated speed			Torque control	
Control lever deflection degrees	mm	Control-rod travel mm min ⁻¹	Control lever deflection degrees	min ⁻¹	Control-rod travel mm	Control lever deflection degrees	min ⁻¹	Control-rod travel mm	min ⁻¹	Control-rod travel mm
1	2	3	4	5	6	7	8	9	10	11
50 ± 0,5	800	12,0-12,5	ca. 31	600	6,4-6,6	ca. 18	425	6,4-6,6	-	-
	1300	13,5		800	0,5-2,0		300	10,8-14,0		
	12,5	1325-1340		1300	0,5-2,0		500	3,2-5,3		
	4,0	1445-1485					640	0		
	0	1495-1605								

Torque control travel a = mm

Speed regulation: At

1 mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°)		Control rod stop at speed	Fuel-delivery characteristics Idle		Starting fuel delivery	
min ⁻¹	cm ³ /1000 strokes	min	min ⁻¹	cm ³ /1000 strokes	min ⁻¹	cm ³ /1000 strokes
1	2	3	4	5	6	7
1300	381,0-385,0		425	72,0-76,0	-	-
1300	RW = 13,5 mm	Full-load screw contacting		zu. Streuung 12,0		

Checking values in brackets

* Adjusted with KDEP 1533

11.83

BOSCH

Geschäftsbereich KH Kundendienst Kfz Ausrüstung
c/o Robert Bosch GmbH D-7 Stuttgart Postfach 50 Printed in the Federal Republic of Germany
Normale Druckgröße: 11,83 mm (11,83 mm) für Robert Bosch GmbH

Testoil-ISO 4113

Inlet pressure 3 bar with overflow quantity 10 - 12 l/min
(measured at return).

Instead of an overflow valve connect a manually-operated
valve of at least 1/2" nominal width into the return.
Overflow quantity as well as inlet pressure must be ob-
served precisely.

Also note that the calibrating fluid temperature 42° - 45°C
must be measured at the return.

Test specifications

Fuel injection pumps and governors

WPP 001/4 MTU 29,9 f

2. Edition

En.

PE 8 ZWM 150/120 RS 1035 RQU 300-500/1100 ZWA 59 DR

Komb.-Nr. 0 406 038 024

1-2-6-3-4-5-7-8 je $45^\circ \pm 0,5^\circ (\pm 0,75^\circ)$

Governor adjustment according to VDT-I-420/112

Replaces 11.83

Firm: MTU

Engine: MB 837 EA - Italien

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

2,5-2,6(2,45-2,65)

Port closing at prestroke mm (from BDC)

Rotational speed min ⁻¹	Control-rod travel mm	Fuel delivery Average value cm ³ /1000 strokes	Difference in fuel delivery cm ³ /1000 strokes	Fuel delivery Checking values cm ³ /1000 strokes	Spring pre-tension (torque-control valve)
1	2	3	4	5	
1000	18,0	527,0-537,0	14,0(21,0)	524,0-540,0	
1000	9,0	175,0-195,0	12,0(18,0)	170,0-200,0	
300	9,0	104,0-124,0	16,0(24,0)	99,0-129,0	
1100	12,3	Sect. c	12,0(18,0)		
800	13,2		16,0(24,0)		
425	6,7		12,0		

Adjust the fuel delivery from each outlet according to the values in

B. Governor settings

Upper rated speed			Medium rated speed			Lower rated speed			Torque control	
Control lever deflection degrees	mm	Control-rod travel min ⁻¹	Control lever deflection degrees	min ⁻¹	Control-rod travel mm	Control lever deflection degrees	min ⁻¹	Control-rod travel mm	min ⁻¹	Control-rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca. 65	800	18,0-18,5	ca. 39	500	7,0	ca. 33	425	6,6-6,9	100	12,3
	1100	12,3					300	13,0-15,0		
	11,3	1125-1140	ca. 19	300	7,0		400	7,8- 9,0	800	13,1+0,2
	5,0	1189-1215					500	1,0- 3,3		
	0	1255-1275					535	0 - 0,5		

Torque control travel a = 0,2 mm +0,05

Speed regulation: At

1 mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°)		Control rod stop at speed		Fuel-delivery characteristics		Starting fuel delivery	
min ⁻¹	cm ³ /1000 strokes	min ⁻¹		min ⁻¹	cm ³ /1000 strokes	min ⁻¹	cm ³ /1000 strokes
1	2	3		4	5	6	7
1100	302,0-308,0 (300,0-310,0)	700 (Strap)		800	331,0-351,0 (326,0-356,0)	425	53,0-59,0

Checking values in brackets

03.84

BOSCH

Geschäftsbereich KH Kundendienst Kfz-Ausrüstung
 c by Robert Bosch GmbH, D-7 Stuttgart 1, Postfach 50 Printed in the Federal Republic of Germany
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Testoil-ISO 4113

Test specifications

Fuel injection pumps and governors

WPP 001/4 MTU 31,7 g

1. Edition

En.

PE 8 ZWM 160/120 RS 2001 RQUV 300-1050 ZWA 65 R

Komb.-Nr. 0 406 038 023

1 - 2 - 6 - 3 - 4 - 5 - 7 - 8 je $45^\circ \pm 0,5^\circ (\pm 0,75^\circ)$

Note VDT-W-Gen./7

Replaces

Firm: MTU

Engine: 396-03
960 kW

All test specifications apply only to Bosch fuel-injection pump test benches and equipment

A. Fuel-injection-pump settings

Port closing at prestroke $(2,5 - 2,6)$ mm (from BDC) $7 \text{ cyl. } 8$

Rotational speed min ⁻¹	Control-rod travel mm	Fuel delivery Average value cm ³ /1000 strokes	Difference in fuel delivery cm ³ /1000 strokes	Fuel delivery Checking values cm ³ /1000 strokes	Spring pre-tension (torque-control valve)
1	2	3	4	5	
1000	18,0	622,0-636,0	20,0 (30,0)	619,0 - 639,0	-
1000	9,0	220,0-248,0	28,0 (42,0)	215,0 - 253,0	
300	9,0	104,0-128,0	16,0 (24,0)	99,0 - 133,0	

Adjust the fuel delivery from each outlet according to the values in

B. Governor settings

Upper rated speed			Medium rated speed			Lower rated speed			Torque control	
Control lever deflection degrees	mm	Control-rod travel min ⁻¹ mm	Control lever deflection degrees	min ⁻¹	Control-rod travel mm	Control lever deflection degrees	min ⁻¹	Control-rod travel mm	min	Control-rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca. 82	1050	18,0	ca. 27	375	8,0	ca. 21	300	8,0	-	-
	17,0	1055-1075		200	14,3-17,2		200	10,8-14,2		
	4,0	1150-1210		300	10,3-11,8		400	3,9-5,0		
	1250	0-2,0		500	1,9-3,7		590	0		
				720	0					

Torque control travel a = mm

Speed regulation: At

1 mm less control rod travel

C. Settings for fuel-injection pump with fitted governor

Full-load delivery on governor control lever (Test oil temperature 40°)		Control rod stop at speed		Fuel-delivery characteristics		Starting fuel delivery	
min ⁻¹	cm ³ /1000 strokes	min ⁻¹	idle stop	min ⁻¹	cm ³ /1000 strokes	min ⁻¹	cm ³ /1000 strokes
1	2	3		4	5	6	7
			300 = RW 8,0 mm	-	-	-	-
Not known		The full-load delivery is adjusted on the engine in accordance with the engine inspection sheet.					

Checking values in brackets

03.84

5

Test Specifications Fuel Injection Pumps and Governors

40

WPP 001/4 MB 2,0 L

1. Edition

En

PES 4 M 55 C 320 RS 152-1

RSF 375/2300 M 55

Komb.Nr. 0 400 074 964/Sales model 0 400 074 965

1 - 3- 4 - 2

0-90-180-270

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers.

supersedes

company Daimler-Benz

engine OM 601

53 kW

Europa

A. Fuel Injection Pump Settings

Port closing at prestroke

2,00-2,10
(1,95-2,15)

mm (from BDC)

Control rod travel

RW 20,0-22,0 mm

Rotational speed	Control rod travel	Fuel delivery	Difference	Control rod travel	Fuel delivery	Spring pre-tensioning (compensating valve)
rev/min	mm	cm ³ /100 strokes	cm ³ /100 strokes	mm	cm ³ /100 strokes	mm
1	2	3	4	2	3	6
1000	12,1+0,1	3,1-3,2	0,25(0,3)			
375	6,4-6,6	0,5-0,6	0,10(0,15)			
1800			0,25(0,3)			
2200			0,25(0,3)			
Before starting testing, see back for important information!						

Set uniform delivery according to the values in []

Checking values in brackets

B. Governor Settings

Lower rated speed			Upper rated speed			Variations in control rod travel		
Degree of deflection of control lever	Control rod travel	Rotational speed	Degree of deflection of control lever	Control rod travel	Rotational speed		Rotational speed	Control rod travel
1	2	3	4	5	6	7	8	9
13-17	① min. 12,6	250	50	⑦ 11,3-11,5	2200		⑫ 100	min. 20,6
	② 6,4- 6,6	375		⑧ 8,8- 9,2	2500		⑬ 1800	11,8-12,0
	③ **	400		⑨ -			⑭ 1000	12,1-12,2
	④ -			⑩ 0-1,0	2950			
	⑤ 2,5	630-730		⑪			⑥ Switching point	

C. Settings for Fuel Injection Pump with Governor Mounted

Full-load delivery		Full-load speed regulation	Variations in fuel delivery		Starting fuel delivery		Difference
Test oil temp 40°C (104°F)					Idle		
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	cm ³ /1000 strokes
1	2	3	4	5	6	7	8
2200	33,0-35,0 (32,0-36,0)	2500* 8,8-9,2	1800	34,0-35,5 (33,0-36,5)	100	min. 55	6,0
					375	5,0-6,0 (4,5-9,0)	1,0
			1000	31,0-32,0 (30,0-33,0)	2500	22,0-26,0 (21,0-27,0)	1,5
							2,5 See ⑮
							3,0 Point 8 a ⑯

Checking values in brackets

Cd. 2,4 less control rod travel than in Column 2

Testoil-ISO 4113

L5

BOSCH

 Geschäftsbereich KH Kundendienst Kfz-Ausrüstung
 1980 by Robert Bosch GmbH, Postfach 50, D-7000 Stuttgart 1 Printed in the Federal Republic of Germany
 Imprime en Republique Federale d'Allemagne par Robert Bosch GmbH

L5

MB 3.0

1. ** Position the idle-speed auxiliary spring at $n = 400 \text{ min}^{-1}$ so that the control-rod travel is forced further by $0.1 \pm 0.2 \text{ mm}$.
2. Adjusting the idle control-lever position:
At 1000 min^{-1} , control-rod travel $1.9 - 2.0 \text{ mm}$.
3. Testing the idle-speed auxiliary spring shutoff
Control-lever position 46° . No change in control-rod travel after switching point up to 550 min^{-1} .
Control-lever position 30° . Rotational-speed range $350 \text{ min}^{-1} - 450 \text{ min}^{-1}$.
4. Testing the pneumatic shutoff box
Control lever against idle stop.
At $n = 375 \text{ min}^{-1}$ and 450 mbar (vacuum) (338 mmHg) the control rod must move briskly to RW (control-rod travel) = 0 mm .
5. overflow valve 1 469 990 351
- 6 *FB (start of delivery) difference between max. and min. value: 1° camshaft
- 7 Set the idle at the PLA aneroid box. To do so, release the lock nut.
- 8 Set the pneumatic idle increase (PLA):
At 0.4 bar overpressure, $n = 425 \text{ min}^{-1}$, RW (control-rack travel) = $8.4-9.9 \text{ mm}$ ($12-20 \text{ cm}^3/1000 \text{ strokes}$).
- 9 Check for leaks (vacuum test) at the PLA aneroid box
Apply 0.8 bar to the PLA aneroid box through a 3-way cock and a pressure gauge. Using the 3-way cock, separate the vacuum supply from the PLA and the pressure gauge. Permissible pressure drop = 30 mbar in 15 s .
- 10 FBG (start of delivery sensor) adjustment
Adjustment and locking of FBG as per the FB average value of all cylinders, 19.5 ± 0.2 (0.3) $^\circ$ camshaft after cylinder 1.

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 MB 2,0 L 1

1. Edition

En

PES 4 M 55 C 320 RS 152-1
RSF 375/2250 M 55-1

supersedes

company Daimler Benz
engine OM 601
53 kW
Sweden

Komb.Nr. 0 400 074 959/Sales model 0 400 074 960

1 - 3 - 4 - 2

0-90-180-270

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

2,00-2,10
(1,95-2,15)

mm (from BDC)

RW 20,0-22,0 mm

Control rod travel

Testoil-ISO 4113

Rotational speed	Control rod travel	Fuel delivery	Difference	Control rod travel	Fuel delivery	Spring pre-tensioning (compensating valve)
rev/min	mm	cm ³ /100 strokes	cm ³ /100 strokes	mm	cm ³ /100 strokes	mm
1	2	3	4	2	3	6
1000	12,1+0,1	3,1-3,2	0,25(0,3)			
375	6,4-6,6	0,5-0,6	0,10(0,15)			
1800			0,25(0,3)			
2200			0,25(0,3)			
Befor starting testing, see back for important information!						

Set uniform delivery according to the values in

Checking values in brackets

B. Governor Settings

Lower rated speed			Upper rated speed			Variations in control rod travel		
Degree of deflection of control lever	Control rod travel	Rotational speed	Degree of deflection of control lever	Control rod travel	Rotational speed		Rotational speed	Control rod travel
1	mm	rev/min	4	mm	rev/min	7	rev/min	mm
13-17	min. 12,5	250	50	11,3-11,5	2200		100	min. 20,6
(1)	6,4-6,6	375	(7)	8,8-9,2	2500		1800	11,8-12,0
(2)			(8)				(12)	
(3)	**	400	(9)	-			(13)	
(4)	-		(10)	0-1,0	2950		1000	12,1-12,2
(5)	2,5	630-730	(11)				(14)	
							(6)	Switching point

C. Settings for Fuel Injection Pump with Governor Mounted

Full-load delivery		Full-load speed regulation	Variations in fuel delivery		Starting fuel delivery		Difference
Test oil temp 40°C (104°F)					Idle		
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	cm ³ /1000 strokes
1	2	3	4	5	6	7	8
2200	33,0-35,0 (32,0-36,0)	2500*	1800	34,0-35,5 (33,0-36,5)	100	min. 55	6,0
		8,8-9,2			375	5,0-6,0	1,0
						(4,5-9,0)	1,5
			1000	31,0-32,0 (30,0-33,0)	2500	22,0-26,0 (21,0-27,0)	2,5
							3,0
							See Point 8 a
							(12a)
							(15)
							(16)

Checking values in brackets

Ca. 2,4 less control rod travel than in Column 2

BOSCH

Geschäftsbereich KH Kundendienst Kfz-Ausrüstung
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Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

MB 3.0

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2. Adjusting the idle control-lever position:
At 1000 min^{-1} , control-rod travel 1.9 - 2.0 mm.
3. Testing the idle-speed auxiliary spring shutoff
Control-lever position 46° . No change in control-rod travel after switching point up to 550 min^{-1} .
Control-lever position 30° . Rotational-speed range 350 min^{-1} - 450 min^{-1} .
4. Testing the pneumatic shutoff box
Control lever against idle stop.
At $n = 375 \text{ min}^{-1}$ and 450 mbar (vacuum) (338 mmHg) the control rod must move briskly to RW (control-rod travel) = 0 mm.
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- 6 *FB (start of delivery) difference between max. and min. value: 1° camshaft
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At 0.4 bar overpressure, $n = 425 \text{ min}^{-1}$, RW (control-rack travel) = 8.4-9.9 mm (12-20 $\text{cm}^3/1000$ strokes).
- 9 Check for leaks (vacuum test) at the PLA aneroid box
Apply 0.8 bar to the PLA aneroid box through a 3-way cock and a pressure gauge. Using the 3-way cock, separate the vacuum supply from the PLA and the pressure gauge. Permissible pressure drop = 30 mbar in 15s.
- 10 FBG (start of delivery sensor) adjustment
Adjustment and locking of FBG as per the FB average value of all cylinders, 19.5 ± 0.2 (0.3) $^\circ$ camshaft after cylinder 1.

BOSCH TEST SPECS. IP ASSEMBLY
 Pump: PES 6 P 120 A 720 RS 7178
 Regulator: RE 30
 IP ASSEMBLY 0 402 796 800

TEST SHEET: MAC 12,0 g
 Edition: 06. 90 (1)
 Type number: 0 412 726 822
 Type number: 0 421 890 009
 CUSTOMER IDENT. NO.: -- --

Customer-specific details

Customer: MACK
 Engine: E 7 - 400
 Output kW: 298
 at 1/min: -

Min Max

PC mark Cyl. No. 6
 Pulse wheel position
 (PC cam) °CS 0 of CS CYL 6
 Tolerance +/- °CS 0.2
 P Tolerance +/- °CS 0.5

TEST PREREQUISITES

Test oil inlet temperature °C 38 42
 Overflow valve 2 417 413 011
 Inlet pressure bar - - -
 Overflow 1/h 160 170
 Calibrating nozzle-holder assembly 1 688 901 101
 Opening pressure bar 207 210
 Perforated plate diameter mm 0,6
 Test pressure line 1 680 750 008
 Dimensions:
 Outer diameter mm 6,0
 x wall thickness mm 2,0
 x length mm 600

Section B -

Actuator test
 - Check values denoted by "P"
 - Assembly warm-up time: 3 mins. at
 n = 600 1/min, U/Norm = 2.5 V

CONTROL-ROD PICKUP SETTING

Test speed 1/min 0
 Setting value
 U/Norm V 3.10
 Control-rod travel mm 12.95 13.05
 P Control-rod travel mm 12.90 13.10
 Check value
 U/Norm V 1.70
 Control-rod travel mm 5.90 6.40
 P Control-rod travel mm 5.85 6.45

TEST SPECIFICATIONS

Section A -
 Setting values of injection pump
 - Check values denoted by "P"
 - No basic setting. Equal delivery
 setting under Section C

Stop position

U/Norm V min.
 Control-rod travel mm 0.5 1.0
 P Control-rod travel mm 0.4 1.1

PORT CLOSING

PC setting cyl. 6
 Test pressure bar 22 24
 Prestroke (from BDC) mm 2,75 2,85
 Prestroke (from BDC) mm 2,70 2,90
 Control-rod travel mm 10,3 10,7
 Cam sequence 6 - 2 - 4 -
 1 - 5 - 3
 PC difference °CS 60 each
 tolerance +/- °CS 0,50
 tolerance +/- °CS 0,75

SPEED SENSOR SIGNALS

- Test with control rod in stop position
 Speed 1/min 60
 pos.amplitude V 0.8 2.0
 P pos.amplitude V 0.6 3.0
 Speed 1/min 600
 Difference
 Amplitude to amplitude V max. 1.4

Continued on next page

Testoil-ISO 4113

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	Min	Max
--	-----	-----

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Section C -

Injection pump with actuator

- Check values denoted by "P"

FUEL DELIVERY TEST AND SETTING

Test point V 1

Speed	l/min	900	
U/Norm	V	3,400	
Fuel delivery	cm ³ /1000str	269,0	271,0
P Fuel delivery	cm ³ /1000str	266,0	274,0
Dispersion	cm ³ /1000str	5,0	
P Dispersion	cm ³ /1000str	9,0	

Test point L1

Speed	l/min	325	
U/Norm	V	1,45	
Fuel delivery	cm ³ /1000str	41,0	47,0
P Fuel delivery	cm ³ /1000str	38,0	50,0
Dispersion	cm ³ /1000str	8,0	
P Dispersion	cm ³ /1000str	12,0	

Testoil-ISO 4113

BOSCH TEST SPECS. IP ASSEMBLY
 Pump: PE 6 P 120 A 320 RS 3239
 Regulator: RE 24
 IP ASSEMBLY 0 401 996 701

TEST SHEET: VOL 12,2 g
 Edition: 06.90 (1)
 Type number: 0 411 826 785
 Type number: 0 421 890 008
 CUSTOMER IDENT. NO.: -- --

Customer-specific details

Customer: VOLVO (USA)
 Engine: TD 122 FPQ | TD 122 FIQ
 Output kW: 272 | 242
 at 1/min: 1900 | 1900

Min Max

Min Max

TEST PREREQUISITES

Test oil inlet temperature °C 38 42
 Overflow valve 2 417 413 064
 Inlet pressure bar 1.5
 Overflow 1/h 100 120

Calibrating nozzle-holder assembly 1 688 901 019

Opening pressure bar 207 210

Perforated plate diameter mm 0,8

Test pressure line 1 680 750 067

Dimensions:
 Outer diameter mm 6.00
 x wall thickness mm 1.50
 x length mm 1000

TEST SPECIFICATIONS

Section A -
 Setting values of injection pump
 - Check values denoted by "P"
 - No basic setting. Equal delivery setting under Section C

PORT CLOSING

PC setting cyl. 1
 Test pressure bar 25 27
 Prestroke (from BDC) mm 2,6 2,7
 Prestroke (from BDC) mm 2,55 2,75
 Control-rod travel mm 10,0 11,0
 Cam sequence 1 - 5 - 3 -
 6 - 2 - 4

PC difference °CS 60 each
 tolerance +/- °CS 0.50
 tolerance +/- °CS 0.75

PC mark Cyl. No. 1
 Pulse wheel position (PC cam) °CS 0 of CS CLY1
 Tolerance +/- °CS 0.2
 P Tolerance +/- °CS 0.5

Section B -

Actuator test
 - Check values denoted by "P"
 - Assembly warm-up time: 3 mins. at
 n = 600 1/min, U/Norm = 2.5 V

CONTROL-ROD PICKUP SETTING

Test speed 1/min 0

Setting value

U/Norm V 3.10
 Control-rod travel mm 12.95 13.05
 P Control-rod travel mm 12.90 13.10

Check value

U/Norm V 1.70
 Control-rod travel mm 5.90 6.40
 P Control-rod travel mm 5.85 6.45

Stop position

U/Norm V min.
 Control-rod travel mm 0.5 1.0
 P Control-rod travel mm 0.4 1.1

SPEED SENSOR SIGNALS

- Test with control rod in stop position

Speed 1/min 60
 pos.amplitude V 0.8 2.0
 P pos.amplitude V 0.6 3.0

Speed 1/min 600
 Difference Amplitude to
 amplitude V max. 1.4

Continued on next page

Testoil-ISO 4113

Min Max

Section C -

Injection pump with actuator

- Check values denoted by "P"

FUEL DELIVERY TEST AND SETTING

Test point V 1

Speed	1/min	700	
U/Norm	V	3,440	
Fuel delivery	cm3/1000str	251,0	254,0
P Fuel delivery	cm3/1000str	248,0	257,0
Dispersion	cm3/1000str	5,0	
P Dispersion	cm3/1000str	9,0	

Test point L1

Speed	1/min	250	
U/Norm	V	1,360	
Fuel delivery	cm3/1000str	17,0	27,0
P Fuel delivery	cm3/1000str	14,0	30,0
Dispersion	cm3/1000str	5,0	
P Dispersion	cm3/1000str	9,0	

Testoil-ISO 4113

BOSCH TEST SPECS. IP ASSEMBLY
 Pump: PES 6 P 110 A 720 RS 3231
 Regulator: RE 24
 IP ASSEMBLY 0 402 196 701

TEST SHEET: DEE 10,1 k
 Edition: 06.90 (1)
 Type number: 0 412 016 729
 Type number: 0 421 890 006
 CUSTOMER IDENT. NO.: -- --

Customer-specific details

Customer: JOHN DEERE
 Engine: 6101 HRW 02 (tractor)
 Output kW: 224
 at 1/min:

	Min	Max
PC mark		
Pulse wheel position (PC cam)	°CS	10.5 of CS CYL1
Tolerance	+/-°CS	0.2
P Tolerance	+/-°CS	0.5

TEST PREREQUISITES

	Min	Max
Test oil inlet temperature °C	38	42
Overflow valve	2 417 413 057	
Inlet pressure bar	1.5	
Overflow 1/h	-	-
Calibrating nozzle-holder assembly	0 681 343 009	
Opening pressure bar	172	175
Perforated plate diameter mm	-	-
Test pressure line	1 680 750 015	
Dimensions:		
Outer diameter mm	6.00	
x wall thickness mm	1.50	
x length mm	600	

Section B -
 Actuator test
 - Check values denoted by "P"
 - Assembly warm-up time: 3 mins. at
 n = 600 1/min, U/Norm = 2.5 V

CONTROL-ROD PICKUP SETTING

	1/min	0
Test speed		
Setting value		
U/Norm	V	3.10
Control-rod travel	mm	12.95 13.05
P Control-rod travel	mm	12.90 13.10
Check value		
U/Norm	V	1.70
Control-rod travel	mm	5.90 6.40
P Control-rod travel	mm	5.85 6.45

TEST SPECIFICATIONS

Section A -
 Setting values of injection pump
 - Check values denoted by "P"
 - No basic setting. Equal delivery setting under Section C

	min.	
U/Norm	V	
Control-rod travel	mm	0.5 1.0
P Control-rod travel	mm	0.4 1.1

PORT CLOSING

	1	27
PC setting cyl.		
Test pressure bar	25	
Prestroke (from BDC) mm	3.45	3.55
Prestroke (from BDC) mm	3.40	3.60
Control-rod travel mm	9.0	12.00
Cam sequence	1 - 5 - 3 -	6 - 2 - 4
PC difference	°CS	60 each
tolerance	+/-°CS	0.50
tolerance	+/-°CS	0.75

SPEED SENSOR SIGNALS

- Test with control rod in stop position

	1/min	60
Speed		
pos.amplitude V		0.8 2.0
P pos.amplitude V		0.6 3.0
Speed	1/min	600
Difference		
Amplitude to amplitude V		max. 1.4

Continued on next page

Testoil-ISO 4113

Min Max

Section C -

Injection pump with actuator

- Check values denoted by "P"

FUEL DELIVERY TEST AND SETTING

Test point V 1

Speed	l/min	1100	
U/Norm	V	2.706	
Fuel delivery	cm3/1000str	176.0	178.0
P Fuel delivery	cm3/1000str	173.0	181.0
Dispersion	cm3/1000str	5.0	
P Dispersion	cm3/1000str	9.0	

Test point L1

Speed	l/min	425	
U/Norm	V	1.450	
Fuel delivery	cm3/1000str	12.0	20.0
P Fuel delivery	cm3/1000str	9.0	23.0
Dispersion	cm3/1000str	6.0	
P Dispersion	cm3/1000str	10.0	

Testoil-ISO 4113

BOSCH TEST SPECS. IP ASSEMBLY
 Pump: PE 6 P 120 A 320 RS 3207
 Regulator: RE 24
 IP ASSEMBLY 0 401 996 700

0404A/96/97
 TEST SHEET: VOL 12.2 f
 Edition: 06. 90 (1)
 Type number: 0 411 826 772
 Type number: 0 421 890 008
 CUSTOMER IDENT. NO.: -- --

Customer-specific details
 Customer: VOLVO
 Engine: TD 122 FS
 Output kW: 290
 at 1/min: 2050

	Min	Max
PC mark		1
Pulse wheel position		
(PC cam)	°CS	0 of CS CYL1
Tolerance	+/-°CS	0.2
P Tolerance	+/-°CS	0.5

TEST PREREQUISITES

Test oil inlet temperature	°C	38	42
Overflow valve		2 417 413 064	
Inlet pressure	bar	1.5	
Overflow	l/h	100	120
Calibrating nozzle-holder assembly		1 688 901 019	
Opening pressure	bar	207	210
Perforated plate diameter	mm	0,8	
Test pressure line		1 680 750 067	
Dimensions:			
Outer diameter	mm	6.00	
x wall thickness	mm	1.50	
x length	mm	1000	

Section B -
 Actuator test
 - Check values denoted by "P"
 - Assembly warm-up time: 3 mins. at
 n = 600 1/min, U/Norm = 2.5 V

CONTROL-ROD PICKUP SETTING

Test speed	1/min	0	
Setting value			
U/Norm	V	3.10	
Control-rod travel	mm	12.95	13.05
P Control-rod travel	mm	12.90	13.10
Check value			
U/Norm	V	1.70	
Control-rod travel	mm	5.90	6.40
P Control-rod travel	mm	5.85	6.45
Stop position			
U/Norm	V	min.	
Control-rod travel	mm	0.5	1.0
P Control-rod travel	mm	0.4	1.1

TEST SPECIFICATIONS

Section A -
 Setting values of injection pump
 - Check values denoted by "P"
 - No basic setting. Equal delivery
 setting under Section C

PORT CLOSING

PC setting cyl.		1	
Test pressure	bar	25	27
Prestroke (from BDC)	mm	3,6	3,7
Prestroke (from BDC)	mm	3,55	3,75
Control-rod travel	mm	10,0	11,0
Cam sequence		1 - 5 - 3 -	6 - 2 - 4
PC difference	°CS	60 each	
tolerance	+/-°CS	0.50	
tolerance	+/-°CS	0.75	

SPEED SENSOR SIGNALS

- Test with control rod in stop position			
Speed	1/min	60	
pos.amplitude	V	0.8	2.0
P pos.amplitude	V	0.6	3.0
Speed	1/min	600	
Difference			
Amplitude to amplitude	V	max. 1.4	

Continued on next page

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Min Max

=====

S e c t i o n C -

Injection pump with actuator

- Check values denoted by "P"

FUEL DELIVERY TEST AND SETTING

Test point V 1

Speed	l/min	700	
U/Norm	V	3,100	
Fuel delivery	cm3/1000str	248,0	251,0
P Fuel delivery	cm3/1000str	245,0	254,0
Dispersion	cm3/1000str	5.0	
P Dispersion	cm3/1000str	9.0	

Test point L1

Speed	l/min	250	
U/Norm	V	1,300	
Fuel delivery	cm3/1000str	19,0	27,0
P Fuel delivery	cm3/1000str	16,0	30,0
Dispersion	cm3/1000str	5,0	
P Dispersion	cm3/1000str	9,0	

Testoil-ISO 4113

BOSCH TEST SPECS. IP ASSEMBLY
 Pump: PES 6 P 120 A 720 RS 3184
 Regulator: RE 24
 IP ASSEMBLY 0 402 196 700

TEST SHEET: DEE 7,7 I
 Edition: 06.90 (1)
 Type number: 0 412 026 727
 Type number: 0 421 890 006
 CUSTOMER IDENT. NO.: -- --

Customer-specific details

Customer: JOHN DEERE
 Engine: 6.466 A
 Output kW: 161
 at 1/min:

Min Max

Min Max

TEST PREREQUISITES

Test oil inlet temperature	°C	38	42
Overflow valve		2 417 413 057	
Inlet pressure	bar	1.5	
Overflow	l/h	-	-
Calibrating nozzle-holder assembly		1 688 901 101	
Opening pressure	bar	207	210
Perforated plate diameter	mm	0,6	-
Test pressure line		1 680 750 015	
Dimensions:			
Outer diameter	mm	6.00	
x wall thickness	mm	1.50	
x length	mm	600	

TEST SPECIFICATIONS

Section A -
 Setting values of injection pump
 - Check values denoted by "P"
 - No basic setting. Equal delivery setting under Section C

PORT CLOSING

PC setting cyl.		1	
Test pressure	bar	25	27
Prestroke (from BDC)	mm	3.55	3.65
Prestroke (from BDC)	mm	3.50	3.70
Control-rod travel	mm	9.0	12.00
Cam sequence		1 - 5 - 3 -	6 - 2 - 4
PC difference	°CS	60 each	
tolerance	+/-°CS	0.50	
tolerance	+/-°CS	0.75	

PC mark	Cyl. No.	1
Pulse wheel position (PC cam)	°CS	10.5 of CS CYL 1
Tolerance	+/-°CS	0.2
P Tolerance	+/-°CS	0.5

Section B -

Actuator test
 - Check values denoted by "P"
 - Assembly warm-up time: 3 mins. at n = 600 1/min, U/Norm = 2.5 V

CONTROL-ROD PICKUP SETTING

Test speed	1/min	0
Setting value		
U/Norm	V	3.10
Control-rod travel	mm	12.95 13.05
P Control-rod travel	mm	12.90 13.10
Check value		
U/Norm	V	1.70
Control-rod travel	mm	5.90 6.40
P Control-rod travel	mm	5.85 6.45

Stop position

U/Norm	V	min.
Control-rod travel	mm	0.5 1.0
P Control-rod travel	mm	0.4 1.1

SPEED SENSOR SIGNALS

- Test with control rod in stop position

Speed	1/min	60
pos.amplitude	V	0.8 2.0
P pos.amplitude	V	0.6 3.0
Speed	1/min	600
Difference		
Amplitude to amplitude	V	max. 1.4

Continued on next page

Testoil-ISO 4113

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	Min	Max
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Section C -

Injection pump with actuator

- Check values denoted by "P"

FUEL DELIVERY TEST AND SETTING

Test point V 1

Speed	1/min	1100	
U/Norm	V	2,710	
Fuel delivery	cm3/1000str	140,0	142,0
P Fuel delivery	cm3/1000str	137,0	145,0
Dispersion	cm3/1000str	6,0	
P Dispersion	cm3/1000str	10,0	

Test point L1

Speed	1/min	425	
U/Norm	V	1,400	
Fuel delivery	cm3/1000str	17,0	25,0
P Fuel delivery	cm3/1000str	14,0	28,0
Dispersion	cm3/1000str	8,0	
P Dispersion	cm3/1000str	12,0	

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